SUPPLEMENT.

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FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Meetings of Public Companies.

EBERHARDT AND AURORA MINING COMPANY.

The third annual general meeting of shareholders was held on Tuesday at the Cannon-street Hotel. The chair was occupied by Mr. A. D. De Pass, the Chairman of the company. The notice calling the meeting was read by Mr. Alfred Critchett, the secretary. The report of the directors which was taken as read, was as follows:—

The Chairman, in moving the adoption of the report and accounts, said the shareholders would naturally expect from him some words of explanation in respect to the property since he last had the pleasure of meeting them. At the last meeting they were on the eve of receiving a report from Professor Clayton respecting the property. That report (long delayed on its journey) arrived, and it was further delayed to some extent by the directors before it was circulated amongst the shareholders. The simple reason for the delay was that the directors were then negociating with the vendors for the purpose of bringing about a final settlement of their accounts; and, as the shareholders were well aware, that transaction was one which involved the issue of 1000 shares of this company or not. The vendor was at the present moment in this country, and the directors thought it was to the interest of the shareholders that Professor Clayton's report should be delayed until the settlement with the vendors was effected. That settlement having been effected (and effected in a way which he hoped would meet with the shareholders' approval) the report of Professor Clayton was circulated, minus some extracts entirely in connection with some discovery in relation to the supply of water, by which Professor Clayton stated that if the directors held their hands they might find a valuable property in the supply of water in the district. The directors thought that it was a matter so entirely in the interests of the company, and it was a matter not immediately affecting it, that therefore they published the report *in extenso* with the exception of the portion relating to the supply of water. The settlement with the vendors was made by the surrender to the company of 1000 shares, at the time of the marketable value of 14*l.* or 15*l.*, but which, unfortunately, were now only worth at 7*l.* 10s.; nevertheless, he must appeal to the shareholders to do justice to the present board, when they had to fight a battle to obtain the large consideration which they did obtain at the time in the interests of the company. (Hear, hear.) The vendor also had a claim for something like 15,000*l.* or 16,000*l.* in money upon the company. It was not very easy to find the money unless the directors issued shares to put the company in possession of the funds. It might be a matter of opinion whether or not it would have been wise to have done so; at all events, the board did not like the responsibility of issuing shares at a premium after the experience they had had. Certain members had complained of shares which had previously been issued at a premium going at a discount; therefore, the directors had the satisfaction of knowing that the money had been paid without its affecting the pocket of any individual shareholder, for, of course, what would be the gain of some would be the loss of others, as would especially be the case in this instance. That money had been paid, with the exception of 5000*l.*, which was still due to the vendors, in the full settlement of their claim, and he regretted to have to appear before the shareholders without having the matter fully settled. However, if matters in this company were to-day deemed by the shareholders to be of a satisfactory character, he could only say that the last liability of 5000*l.* outstanding would be paid to the vendors before 12 o'clock to-morrow. (Cheers.) He would next refer to the balance-sheet of the company which had been submitted by the directors, the vouchers of which had been produced and duly audited. On one side was given the production of the bullion, which amounted to 60,000*l.* for the six months ending 30th June last. That produce was distinctly a disappointment to the board, and the shareholders would expect some explanation why it was so. When he last addressed them he believed he stated he thought that they were on the right road, and on the fair road to success. He did not lead them into the region of exalted ideas, he kept things down as much as was compatible with the shareholders' interests; but he certainly did lead them to expect, as he had said, that they were on the right road. Whether he was justified in doing it or not they themselves should judge from the monthly produce. He addressed them in the month of April, and although they had at the time the actual documents (for they took some considerable time to receive), yet the directors received accounts announcing that the total produce for the month of March was $76,000, which he considered a very gratifying return, and fully justified the fair hopes and expectations he held out to the shareholders. (Hear, hear.) In April the returns dropped to $51,000; in May they were $58,000; and in June they dropped to $25,000. The explanation which had been given (for which they had to rely upon the manager's report) was to the effect that the ore from being of a good and reliable character suddenly changed to a poor and capricious character, and involved the mining of 3 tons of ore to obtain 1 ton of ore which was fit to go through the mill. It was a matter of great pain to the directors, and although he had modified his remarks he considered that he stood exonerated in their opinion (looking at the produce of $76,000 in the month of March), and that he did not overstep the bounds of prudence when he stated that the company was on the road to progress. (Hear, hear,) Then, they had had in Nevada an almost unprecedentedly hard winter, with snow storms to June and July; they also had to contend with the new mine rope (which at the last meeting he congratulated the shareholders was working well), but which within a fortnight of being in its place gave way in all directions, causing a great expence to the company, and also frustrating the endeavour of the manager to send to the mills sufficient ore, even of the defective quality he had before mentioned. On the other side of the accounts he would refer to the subject of the expenses, which apparently was a sore subject with many, when he stated that those gentlemen might, perhaps, modify their opinion when the expenses were a little looked into and explained, for the expenditure was not of the onerous character which would justify the remarks which had been made about it. The total expenses had been 55,000*l.* The Eberhardt, the Aurora, and the Ward Beecher took up 25,000*l.* of the amount between them; but he (the Chairman) must state that it must not be put down that the expenses had been incurred solely in getting the ore out of the mine, but a portion of it had been incurred in developing and opening up the mine in a workman-like manner. It was true they might merely extract the ore, but if they did not work the mine properly, and leave a certain portion of dead work, they would really be killing the goose which laid the golden eggs. Of this he was convinced by all he had heard, and all he had read, and all he knew, that never in the history of these mines had they looked so well, or the ore had been exposed of so large a character as at this moment. (Cheers.) The next expense was the Oasis Mill—733*l.*; a dead loss, through an experiment of Mr. Phillpotts, which had failed. Then there was the tramway, 4000*l.*, which should be only half that amount, and possibly not so much. That arose from the bad character of the rope which had been sent out. He (the Chairman) did not attach any importance to the fact that the rope was sent out by the old board of the company, for no doubt that board had secured the best rope. It was the fault of the furnishers, and this company had a claim upon them; but it cost a loss of 2300*l.* to the company, and was a large item in the expenses. Next came the office expenses alluded to, which he could not say anything about; the hauling accounts were mixed up with the tramway, and were for hiring teamsters to carry the ore to the mill. The item of salaries he must not go into. Mr. Phillpotts' salary was back for six months, and it applied to nine months, so that it did not properly belong to the production of silver. The item for professional services applied to Prof. Clayton. The taxes were paid to the United States, and were a moderate sum. Then there were legal expenses. Then there was the amount for exchange, which arose principally from the company not having sufficient capital to carry on the company; and it being necessary to draw bills of exchange between Eberhardt and San Francisco, as there was not sufficient to pay the labourers whilst the silver was being shipped to England. Thus there was a double set of drafts going on, which entailed a considerable expense. That was all he had to say on that subject.

A Shareholder: You have overlooked the International Mill.

The Chairman said it was an omission, and as the subject was an important one he would at once refer to it. That sum of 18,000*l.* for the International Mill was for milling 8800 tons of ore, and it worked out at a considerable sum of money. It cost this company for milling $13 77 c. per ton—a very large amount undoubtedly, and which had no right to be expended, if expended purely and simply for milling; but it was not simply for milling the ore. The expenses had arisen from two causes—the conversion of the stamps, that was to say, 30 of the stamps were for working with the wet process, and Prof. Clayton and some other gentlemen, in conjunction with Mr. Phillpotts himself, determined that when the ore turned out rich it would be wise to have the 30 wet stamps converted into dry stamps, as the percentage obtained from the silver was more by the dry process than by the wet process. That entailed an expense of 4226*l.*, so that the International Mill was charged with an expense of 4266*l.*, which would not have occurred if the stamps had not been converted. That was not the only item in connection with the International Mill which created a greater expense. He had had intimated to him for some time past that the stores account was defective and deficient in quantity, and that a certain proportion of the stores account had been charged for the milling of the ores, in order to bring the accounts into a proper shape, and that that alone had added a considerable item to the expenses. He did not know that he could do better than state plainly that, in the absence of Mr. Phillpotts during his illness, a large amount of supply said to belong to the company, and paid for by the company, was found to be deficient in stock. He would now turn to another matter, and that was the average amount of silver got out of the pulp assay. The shareholders might remember that at the last meeting one of the great featnres which Mr. Ridsdale threw out against the management abroad was that the manager failed to get a sufficient percentage of silver out of the pulp assay, and he thought Mr. Ridsdale was right in calling attention to it. He thought he could not do better than go through the monthly averages of pulp assay. The percentage obtained in January was $30 pulp assay, and they obtained 58 per cent. of silver; the lowness of the pulp assay to some extent accounted for the lowness of the percentage; the quantity crushed in January was 2129 tons. In February they rose to 50 pulp assay, and obtained a percentage of 54, which was not satisfactory. In March, with a pulp of 69, they obtained 84 per cent. of silver. In April they dropped to 52 in pulp assay on the quantity milled (only 1100 tons), and they obtained 85 per cent. of silver. In May they got 47 pulp assay, and 76 per cent. of silver. In June, which appeared one of the most disastrous months to contend with, and which made the accounts look additionally bad, they only reached 40 of pulp assay, and 69 per cent. of silver, and there were only 1100 tons crushed; that was owing to the changeable nature of the ore, and to its variableness of quantity, for although the manager might for a time think he had before him a good quantity of valuable stuff, yet, perhaps, when he had got 500 or 600 tons it became all at once mixed with the limestone of the country, and turned out of a poor character, and it required 3 tons of stuff to be got out before he got 1 ton of good milling ore. So much for the items in the balance-sheet, and he must now go into a few other matters. The general meeting would have been called earlier than it had been, had it not been for one or two circumstances which it was better at once to place before the shareholders. The accounts were audited by the end of August, and the present meeting could have been held some months earlier than it was held; but the directors received at the time the news of the unfortunate calamity—the burning of the International Mill—which frustrated the hopes which the directors had of coming before the shareholders with a balance-sheet, which he was bound to confess was not pleasing; but, with the knowledge gained they were receiving and getting ore of good quality, and largely producing ore, and if the International Mill had not been burned it would have been a matter of intense pleasure to have announced that, however non-profitable the balance-sheet appeared, they had nearly 19,000*l.* as produce from the mine in August. The destruction of the mill led the directors into a different train of thought—should they go before the shareholders with a balance-sheet which showed no dividend, and little or no profit, and not be able to announce that they had something in hand for the future? He thought the shareholders would say that the directors acted judiciously in not calling a meeting until they were prepared to lay something before the shareholders in a tangible way for the government of the concern in the future. Arrangements and negociations were immediately opened with the South Aurora Company, and, without troubling the meeting with all the letters which passed, he would ask the secretary to read the first letter which was addressed to the South Aurora Company, and the letter which was received in reply, and also the contract which had been entered into to work this company's ore by the Stanford mill.

The Secretary read the letters.]

The Chairman continued: In accordance with that, the directors telegraphed to Mr. Phillpotts that he should, in the substance of this method of management, act on behalf of the company, and submit the result to the directors. The result was that the directors received a telegram from Mr. Phillpotts to the effect that he had entered into an arrangement with Mr. Goodfellow to crush this company's ore for six months at $12 per ton, subject to the board's approval. That telegram was received on Sept. 7, and the directors looked upon the matter as pretty well concluded. However, the South Aurora Company did not see it in the same light, and did not seem to know anything about it, although they had intimated the nature of the contract, and afterwards, entirely on their own part, wished to withdraw from it. This matter had been a source of great difficulty to himself and the board to have it carried through; they were assured it was a binding contract, and it was one which the directors did not take upon themselves without great deliberation; and they thought it was a fair arrangement, and one which the South Aurora Company might have been satisfied with, and they were not quite sure they would have the $2 per ton profit which it was believed the arrangement would give them. He was sorry the South Aurora Company did not confirm the contract which had been entered into between Mr. Phillpotts and Mr. Goodfellow; and, as he should like the shareholders to hear the contract, he would ask the secretary to read it.

The Secretary read the contract, which was as follows:—

The Chairman went on to say that if it was not a contract he did not know what the meaning of the word contract was. (Hear, hear.) He had gone into this subject at some length in order to show that the directors, as the trustees of the shareholders, had lost no opportunity in trying to bring about a fair settlement for the crushing of this company's ore. He would not go beyond that; the directors had been twitted and taunted with not having done their duty, and he wished to explain that they had performed their duty. (Hear, hear.) But he was able to state that another arrangement had been made for crushing the ore at the Big Smoky Mill; they had received three weeks returns, each week being about 170 tons. The first average was $56, and they ran to $134 of pulp assay in the next; and they had that morning received information of the third 170 tons crushed, which gave a pulp assay of $97. The Big Smoky Mill had crushed the ore at—as far as he could understand—a payment of $11½; but it cost this company more than $11½—it cost them $14; but it was because the ore had to be conveyed in drays to the Big Smoky Mill, they (the Big Smoky Mill) paying the expenses. If the ore had been crushed by the South Aurora Company at $12 this company would have had to convey the ore to the mill; therefore, it seemed that the two contracts were very much based upon the same principle in point of price. He regretted that he was not able to announce that the South Aurora Company were not crushing the ore with profit to both companies. He would next refer to the management at the mines, which was a subject of a grave character. He believed he was not far wrong in saying that up to within a mouth or six weeks ago the board were pretty united upon the question, and that they had the right manager in Mr. Phillpotts; but shortly afterwards he received an intimation from two gentlemen at the board that they were not satisfied with Mr. Phillpotts, and that Mr. Phillpotts should be exchanged for another manager. (Hear, hear.) Well, he could not agree with that.

A Shareholder: Quite right.

The Chairman said he did not care about "right;" he was no partizan, but he sat at that board in the interests of the Eberhardt and Aurora Company, and he believed at the time that it was an injudicious step to change the manager, as he had believed several times before. He had had misgivings, but he had carefully reflected and pondered over the matter, and he had again come to the conclusion that it would be a dangerous step to promptly dismiss Mr. Phillpotts, and he was confirmed in that opinion by two other gentlemen at the board. Of course, every gentleman at the board had a right to have his own opinion, and in this case the directors could not call themselves a unanimous board, although they were unanimous upon every other question. After mature deliberation, the directors came to this conclusion, and he wished to announce it here, as he thought it was the wisest one, under the circumstances, that as they were unfortunately suffering from the loss of the International Mill, and the directors were in hopes of having arrangements completed with the South Aurora, they could with safety leave the affairs of the company in the hands of another gentleman out there who was in the company's employ, and that they should have Mr. Phillpotts home to England, and put to him categorically every doubt and suspicion they had; and if they were not satisfied with his explanation, he (the Chairman) almost pledged himself that he would obtain Mr. Phillpotts' resignation, and not get his ignominious dismissal, which might lead to trouble hereafter. The directors were aware that there was a party outside who were clamorous for Mr. Phillpotts' dismissal. He hoped that party would never regret the course they had taken. (Hear, hear.) He believed that the course which the board had taken was wise and judicious, and did not compromise the interests of the company. The directors accordingly telegraphed to Mr. Phillpotts, and said they expected him over here for the general meeting. The reply was that he could not leave immediately, as he had two or three important matters to look after. One was Blatchley's suit, which was to come on in October, and which the company had prosecuted with varied success, and thrown out of one court into another. The second reason was the insurance matters connected with the International Mill, which required a gentleman connected with all the details and affairs to see adjusted in a proper manner. For these reasons Mr. Phillpotts had not come home immediately. But this morning the directors had received a telegram of a pleasing character. (A laugh.) Well, as some of the shareholders laughed, perhaps they would anticipate what it was. (Hear, hear.)

Mr. Baxter: We are amused; there is always something pleasing comes before a meeting.—The Chairman said that the telegram just received referred to the Blatchley suit, which was settled in the interests of the company, and thus justified the step which Mr. Phillpotts took in not coming home. (Cheers.) The disputed action was settled, but the amount was to be decided by arbitration. He thought he had now pretty well exhausted his budget; he had told everything he knew, and concealed nothing. (Cheers.) During the time that he had had the honour of presiding at the board they had had anxieties and doubts, and they had also had serious misgivings; but, on the whole, he felt that he was perfectly justified in assuring the shareholders that the company was in a better position than when he last addressed them. It was in the position of being freer from debt, and having a more extensive development opened, and it was the intention of the manager to sink deeper, with the anticipation of getting into the permanent ore channel alluded to in Professor Clayton's report. The directors had raised 5000*l.* amongst themselves to pay off the vendor, as he had already stated, and they had not troubled the shareholders with any calls, nor created any debentures, which Mr. Taylor at the last meeting stood in such dreadful fear of (a laugh), and altogether the affairs of the company stood in a more compact form. The whole thing would resolve itself into a question of management. The question was whether they had an efficient and economical manager, and a manager of ability, in Mr. Phlpotts. (Hear, hear.) Another letter from Prof. Clayton had been received that morning, and showed that in the Eberhardt the company possessed a very valuable property, but they must have a little patience and forbearance, and not expect to extract a dividend out of ore which was variable, but allow the money to be expended in going down to the main ore channel. He would ask the secretary to read Prof. Clayton's letter.

The Chairman then formally moved the adoption of the report and accounts.—Mr. Burnand seconded the resolution.

Mr. Baxter said that the duty devolved upon him of moving an amendment to the resolution, and he must give his reasons, and the reasons of those who were acting with him, for so doing. He wished to disclaim any personal feeling towards any member of the board, or towards Mr. Phillpotts; he simply came forward as a shareholder, holding a considerable number of shares, and with a perfect right (which they all possessed) to discuss fully and fairly the management of the property, and see that what was being done was the best that could be done in the interests of the shareholders. He should like to know whether Prof. Clayton's report was not keep back because it verified the report of Mr. Phillpotts in the first instance as to the quantity of water, and to enable the directors to get the shares from the vendors. As far as the actual financial position of the company went, he was as much in the dark as when he entered the room. As to including in the International Mill account certain sums in order to make up the stores which could not be accounted for, he should like to know whether the Chairman heard that from the manager himself. In the accounts there was one very curious item which the Chairman probably would explain. The Chairman stated that the company had had to incur very considerable expense for wire-tramways, but it was an extraordinary thing that in the last account rendered the wire-tramways were put down at 37,812*l.* as gross expenditure upon capital account, but in the present balance-sheet it was put down as costing 34,999*l.*, showing a difference of 2814*l.* How that had been made to balance he could not understand. Many gentlemen would remember that at the time they were advised to purchase the White Pine Waterworks they were told that if they purchased those waterworks they would not only have an ample supply of water for themselves, but would also be able to supply water to others, which would leave a considerable profit on the transaction. That was a point with which the Chairman should have dealt. In order to arrive at the conclusion whether the manager possessed the confidence of the shareholders, they should look at the circumstances which had arisen. When the manager went out, two years ago, he advised the board that no working capital was necessary, as large and immediate returns would be made; the manager also informed a gentleman, with whom he (the speaker) was acquainted that for the first year of the company's working the shareholders must be satisfied if they only got 30 per cent. (A laugh.) Well, instead of getting 30 per cent., and not wanting capital, the capital had grown from 200,000*l.* to 290,000*l.*, besides the debts which the company owed. He might be told that the contract was only 285,000*l.*, as the vendors had given up the 15,000*l.*, but it had nothing to do with it. What had the shareholders received? They had received one dividend of 1*l.*, which was paid partly from the Ward Beecher Mine and partly from the premium on shares. They had not had one farthing from the Eberhardt and Aurora Mine. Then, they had spent 30,000*l.* upon water. Was all this the fault of the manager or the mine? He believed it was the fault of the manager, and not of the mine. Mr. Phillpotts' original estimate was based on $40 ore; within a few cents they had had had a yield of $40 ore, and, if so, how came it that there was no dividend? Simply because of the gross and improvident expenditure at the mine. The shareholders would remember that Mr. Phillpotts stated that $20 per ton would pay the expenses, and that when the wire-tramway was used the expenditure would be considerably reduced. Prof. Clayton came in, and said the expenses should be $18 per ton. But what was the fact? Why, the expenditure was $34 to the ton, and that was where the profits went. The mine had yielded 135,640*l.* from June last year to June in the present year. It had turned out in bullion 234,777*l.*, and yet they were told this was a worthless property. Here was a quarter of a million of money, and yet not 1s. went to the shareholders. If the present management went on the property was good for nothing. The board had no right to receive telegrams (as he believed they did) week by week as to what was going on at the mines, and yet withhold them from the body of the shareholders.

The Chairman: We received one last week, and I appealed to Mr. Pearless whether we should send to the newspapers, and he said "No." Mr. Pearless is the representative of Mr. Applegarth at the board.

Mr. Pearless said he heard that it was not desirable to publish the telegram, as it might deceive many shareholders on the eve of a general meeting. It might have been sent for an object—he could not tell. It had been thrown in the face of the directors that they had received assays just before the general meetings, and he thought the same thing might occur again.

Mr. Baxter went on to say that the directors were only the trustees of the shareholders, who ought to be put in possession of all information from the mines

whether good or bad. He enquired why pipes had not been laid on to the International Mill to flood it in case of fire, and thus extinguish the flames. He maintained that the manager had entirely failed to do any good for the company, for there was no statement which he had made which was not falsified by the returns made to the shareholders. They must either have an absolute change of management in order to reduce the expenditure, or they must come to the conclusion to abandon the mine, for it was clear with the present state of things they could get no returns. According to Prof. Clayton's report they had a mine which should be paying the shareholders handsomely. He contended that the board had not the confidence of the shareholders, because although they promised at the meeting that they would make things public they had since kept the information they had received to themselves. With respect to the attack made by Mr. Phillpotts upon Mr. Applegarth, it was a slur upon Mr. Applegarth and upon those who were acting with him in the matter to call Mr. Applegarth a "Western adventurer," and charge him with calling the committee together with which he (Mr. Baxter) was acting. If any gentleman present were a holder of 2000 shares, and a creditor for 5000*l.*, as Mr. Applegarth was, would they stand quietly by and not attempt to save the property? Mr. Applegarth had a duty to perform to himself, and was desirous of vindicating his character, and showing that the property was worth what he had represented it to be. He asked whether the shareholders were prepared to go on with the present management, and said he was prepared to test the feeling of the meeting by the following amendment:—"That the shareholders have no confidence in the management either here or in Nevada, and the directors be and are hereby requested to place their offices at the disposal of the shareholders."

Mr. Blatch said he had great pleasure in seconding the amendment. He had not the slightest personal interest beyond a pecuniary interest—that is to say, he did not know any of the gentlemen around him. He entirely agreed with what Mr. Baxter had said, but there were one or two points to which he should wish to draw attention beyond what that gentleman had referred to. It was strange that such a calamity as the burning of the International Mill should be passed without any enquiry as to how it originated. Then, again, with respect to the stamps; they had just been told by the Chairman that they had been changed from wet to dry, but if he remembered rightly Mr. Phillpotts had just before changed them from dry to wet. He believed that enough had been said to show that the management in Nevada was decidedly bad; if Mr. Phillpotts was an incompetent man he was not fit for his place, but if he were competent and did not use his knowledge for the benefit of the company he (Mr. Blatch) would rather have a man who was a greater fool if he would put money in the pockets of the shareholders. (A laugh.) One of the great things of which he had to complain was that information was withheld from the shareholders which they ought to possess.

Mr. Landon, who was somewhat indistinctly heard at times, and spoke amidst some interruption, referred to the observations of the Chairman with respect to the contract with the South Aurora Company, and said that the Chairman had not exactly stated the facts as they really were. He gave his version of the negociations which preceded the drawing up of the so-called contract, and said that the South Aurora directors were distinctly under the impression that the contract was on the basis of $15 per ton for crushing.

Mr. J. G. Taylor: Will you inform us, Mr. Chairman, whether yourself and Mr. Ruck, one of the directors, did not hold shares in the South Aurora and sold about that time?——The Chairman: Fortunately for me I never held a share in the company in my life.

Mr. Henry Moore said he noticed in the accounts of June last that credit was given for 10,916*l.* for stores, and he had looked through the accounts in vain to find a charge made for the purchase of those stores.

The Chairman: If you will look at the first line in the balance sheet you will see that the debit at stores is 22,000*l.* as brought forward from the balance-sheet of last year, and they are credited now as 17,000*l.*, the difference having been used by the company. In the next balance-sheet you bring down the 17,000*l.*

Mr. Moore: You bring forward in Dec. 31, 1871, 13,000*l.*

The Chairman said that Mr. Moore must go back to the previous half-year.

Mr. Moore went on to say that he should like to know what the stores consisted of, and what they had cost. He knew something of mining matters, and thought the directors never ought to have laid before the shareholders such accounts as these. It should also be stated what stores there were on hand, and also what the expenditure had been.

The Chairman: It is so stated.

Mr. Moore asked who could tell the cost of expenditure for stores for the past half-year? He also complained that he had never received the circular of April 22, signed by the secretary, in which it was stated a report had been received from Prof. Clayton, and the directors declined to publish it.

The Chairman: Then it was the fault of the postman.

Mr. Moore said the directors should not be allowed to keep back one item of information from the shareholders. It was a wrong upon the shareholders, and a wrong upon the public, for the shareholders might in ignorance sell their shares.

A Voice: There is no chance of their doing that; they are not saleable.

Mr. Moore: But the public might think there was something good behind, and they might come in and buy shares. With respect to the manager, he knew about him, or his character; but he could not help asking himself this question—the property was sold for 150,000*l.*, and it was stated at the time that that was too large a sum of money. Now, what had been received as the produce of these mines in actual bullion? In 1½ year there had been received 204,000*l.*, and that showed that Mr. Applegarth did not ask too much for his property. But then he came to this, that after paying 24,000*l.* in dividends the directors had 201,000*l.* to account for, and he wanted to know how it was that the shareholders had not received further dividends? He was very glad that Mr. Baxter had moved his amendment, if only to elicit an opinion from that meeting as to the treatment which the shareholders received from the directors and manager of the company.

Mr. Applegarth said there had been a good deal said about his being a "western adventurer," and selling property which was entirely worthless; and also that he, from selfish motives, wanted to get the management of the company into his own hands. It was natural he should want some voice in the management, seeing that he was the representative of 2000 shares, and when he saw that the property, which should be paying 200,000*l.* in dividends, was being wasted by bad management. He was not a scientific man, but he knew something about how mines should be managed, and he had had a good deal of experience. He was one of the earliest who went to the Nevada district, and he had watched the property from the time he camped out in the snow until last March. He knew how milling and mining should be done; and his opinion of how the milling and mining should be done was simply that it should have been done for 50 per cent. less than it had been. He had had offers from practical men to mill the ore for $9 per ton. The shareholders must have the work done upon a business-like and economical basis if they wanted to make money, and if they did that he had no hesitation in saying that they would make a good, profitable, and living concern. He did not know exactly what Mr. Phillpotts meant when he called him (Mr. Applegarth) a "western adventurer." He did not know whether Mr. Phillpotts meant that he was a scoundrel, or whether he ventured his money in mining speculations. Mr. Phillpotts could mean what he liked; he (Mr. Applegarth) took it from the source from whence it came. The company, some time since, had not settled with him, but owed him something in the neighbourhood of 17,000*l.*, and the 5000 shares, which were held until the title was completed, and water sufficient delivered. Mr. Phillpotts and Mr. Attwood measured the water, and reported that there was sufficient water at Sherman Town, independent of the Applegarth springs. And when they determined to build the mills they stated that there was enough at Sherman Town instead of the Applegarth springs, and consequently they had built at Eberhardt, because it was not so far to run the tramway. When the purchase of the White Pine Waterworks was recommended he telegraphed and wrote to the directors, telling them to have nothing to do with the White Pine Waterworks, and that it was valueless to the company to buy at the price asked. He would ask was it not for the identical purpose of getting him to settle with this company for 1000 shares less than the agreement, and the 1000*l.* of money which, he saw by the accounts, was credited as profit or premium on shares? He did not want to throw this company into the winding-up court; he brought it out to make it a success, and he was satisfied it could be done, but he was equally satisfied that it would never be done in the hands it was now in. The sooner they had a change of management the better. He would refer to one more point. Mr. Phillpotts stated that he (Mr. Applegarth) joined him in a telegram to the board asking them to postpone the board meeting last April for the purpose of advocating Mr. Phillpotts. He (Mr. Applegarth) wished to state that it was for the purpose of rejecting him. He asked the expenses per ton, and Mr. Phillpotts said that the month before they were $22, and he (Mr. Applegarth) said it should be done for $15. With a change of management they might yet have happy and satisfactory results from the Eberhardt Mine.

Mr. Bizzey said he had been engaged in an investigation of the affair of the South Aurora Company, and he could state that the average of their expenses for milling their ores was $22: and why the expenses in this company should be $34 he could not conceive, for the ore from the Eberhardt Mine was similar to that from the South Aurora. He would allude to another point, namely, as to the percentage of ore which was obtained from the assay value. He heard that only 65 per cent. of valuable ore on the assay ore was obtained. He had a report issued by the South Aurora, compiled by Professor Clayton, and all their recent assay values were 84 per cent. He should like to know how it was that in this company so large a percentage as the difference between 65 and 84 per cent. should be thrown away?

The Chairman: You are making a mistake; the average was 73, and once went as high as 85.

Mr. Bizzey: Still there is a justification of my remarks, and it shows you that Mr. Phillpotts is not the man for the management.

Mr. J. G. Taylor asked whether it was a fact that the Chairman offered his resignation and afterwards withdrew it, after saying that he had received an important letter from Mr. Phillpotts, which he would not show to anybody else until he had seen Mr. Phillpotts' brother? He also asked whether the Chairman or Mr. Phillpotts paid 10 guineas for an insertion in one of the papers of an article highly in praise of Mr. Phillpotts. (A laugh.) He was afraid the fire at the International Mill was the work of an incendiary. People who came home said that Mr. Phillpotts was unpopular. A gentleman—a merchant in the City of London—whose son had been at the mines, had informed him (Mr. Taylor) that his son on his return had stated that whatever was got out of the mine Mr. Phillpotts would spend 10 per cent. more. He did not know where the directors were going to get money to pay Mr. Applegarth; perhaps it might be Mr. Phillpotts' brother who lent the money, or perhaps the directors. When Mr. Ridsdale was Chairman, he said that Mr. Phillpotts had not had time; at the last meeting Mr. de Pass said that Mr. Phillpotts had not had time, and added, "Give him time to see what he will do, and if he is not the man I expect, let him stand aside." He now called upon Mr. de Pass to do that.

The Chairman, in replying to the above questions, said that the board must indeed be fallen when, in the midst of 300 or 400 gentlemen, not one had got up to put in a single word for the directors. It was indeed a comment upon men who came forward to put themselves in the breach, and used their utmost exertions, and gave their time and labour, to find at the second meeting, because they were not successful through misfortunes, that not one gentleman had risen and put in a word for the board. He assured them again that he was no partisan in the affairs of this company. He was not a Phillpottite nor an Applegarthite; but he was the largest shareholder in the company, and had never sold a share in it, for he had faith in the concern, and would hold his property to the last. (Cheers.) Gentlemen came forward and asked the shareholders to cast a slur upon the management in this country, and some of the gentlemen who thus came forward had been continually flooding the market with their shares from the month of June or July last. He asked them to pause before they passed such an amendment as that proposed by Mr. Baxter, for if they passed it they might frighten honourable men from coming forward and taking a share in the management of companies in the City of London. (Cheers.) He had seen the circular about he himself being the nominee of Mr. Phillpotts. What was the meaning of the word nominee? Why, a nominee was a man who received his qualification from others for the purpose of doing their dirty work. (No, no.) He contended that such was what it meant. But what was the fact? Why, he was elected Chairman by a large body of Eberhardt shareholders holding over 100 shares each; he was selected by those gentlemen; but he had endeavoured to steer a strictly independent course. If he held the position he did in this company, and followed blindfold the changes and ramifications which took place, and not use his own judgment, he should be unfitted to be the Chairman of this or any other company. (Cheers.) Now, in respect to Mr. Baxter, a gentleman to whom every respect must be paid, and who had never put forward to him (the Chairman) individually anything but in language of a proper and becoming kind; but he would ask the shareholders did they ever hear such a weak address as Mr. Baxter made? Did Mr. Baxter bring a single statement upon which they could bring an idea to bear beyond the single one of the question of management. Mr. Baxter was a large shareholder, and as such he was entitled to every respect; but if he had been the nominee of Mr. Applegarth he (Mr. Baxter) could not have spoken more against the company than he had done to-day. He defended the course which the directors had taken in connection with the proposal to purchase the White Pine Waterworks. Then as to the question of whether Mr. Applegarth had been pressing for his claims. Why, he (the Chairman) had been at the office, and Mr. Pearless, who was Mr. Applegarth's friend, had pressed in all ways for this money; Mr. Applegarth went to the length of saying half-a-dozen times that if the money was not paid he would wind-up the company, and on one occasion Mr. Applegarth took out his watch and said that if he (the Chairman) and Mr. Ruck did not send in their resignations in an hour he would send in his bill to the secretary. Upon that he (the Chairman) determined not to give up the management until he came before the shareholders. On many occasions Mr. Applegarth had threatened to attack the property both here and in Nevada. But now the shareholders were now out of Mr. Applegarth's power; Mr. Applegarth had 5000*l.* of promissory notes, and to-morrow the money could be paid to him if he presented the notes, and then they had parted for ever, he hoped, with Mr. Applegarth and his claims upon this company. (Cheers.) Mr. Applegarth's holding was stated to be 2000 shares; he (the Chairman) had the gravest doubts of the truth of that statement by 50 per cent. At the present moment Mr. Applegarth stood upon the register as holding 59 shares. (Great laughter.) He knew, or he believed, that Mr. Applegarth had an interest in some shares held by Mr. Pearless. Mr. Pearless had 2100 shares in his name, but he believed he was perfectly correct in saying that many of those shares belonged to other vendors, and not to Mr. Applegarth, and, therefore, the statement that Mr. Applegarth held 2000 shares was an insult to the shareholders. Mr. Applegarth had been parting with his shares for some time past, and he contended that he was himself the largest shareholder in the Eberhardt and Aurora, having never sold a share. Mr. Pearless, who was Mr. Applegarth's representative, was a director, and knew everything which went on in the company's office; was Mr. Pearless included in the resolution of Mr. Baxter? (A laugh). He hoped the shareholders would not allow their good sense to be led away, or allow the company, instead of coming into the hands of men of position and character in the City of London, to drift into the hands of those who, he trusted, would be everything they could hope and expect, but upon which point he had, he must confess, some twinge of conscience. (Loud cheers).

With respect to not giving information, that was an unfair and an untruthful charge, and he defied any gentleman to say that any information was withheld from the shareholders of a vital or important character. There was a gentleman who would go and write circulars, and make the shares up to any price, and then go and say, "What a deceitful board of directors!" (A laugh.) He (the Chairman) contended that the board acted wisely and prudently in making the statements monthly instead of weekly. (Cheers.) He knew of nothing which had been kept from the shareholders. The Eberhardt offices were as open as the street. Mr. Applegarth had constant access to the books and vouchers, and he had seen him by the hour together talking to the secretary. Besides, how could there be any secret when Mr. Pearless was at the board? He himself was no dealer in shares; but this information which was wanted was for certain gentlemen, in order that they might get out of their shares, or do something with respect to them. (Cheers.) If the shareholders wanted a dividend, he had his own views of working the company, but he had no views as to whether a man should sell 200 or 500 at a certain sum. (Cheers.) Mr. Applegarth was a hard and tough customer to deal with. (A laugh.) Many friends of his (the Chairman's) had purchased shares; when they looked at the transfer-book, where did those shares come from? Why, from Applegarth, Pearless—Pearless, Applegarth—Applegarth, Pearless, and so on. (Loud Laughter.) However, he would dilate no longer upon that point, for gentlemen were often influenced in an expression of opinion by the market price of shares—at all events, Mr. Taylor was if he might judge from that gentleman's circular. (A laugh.) Mr. Taylor said, "Look at your magnificent property—its wondrous wealth: Aladdin's lamp was nothing to it." (A laugh.) What was the fact? On Treasure Hill, at the present moment, he (the Chairman) did not believe that there was a successful mining company in existence. The South Aurora was simply down to nothing: there was not a ton of ore to bring to the mill, and the mill was standing still. He was told that on Treasure Hill there was not a mine returning a shilling; and if there were to be an exception, and if there was to be the wealth of Treasure Hill discovered, which he believed it contained, if ever that was to be discovered he believed it would be through the means of this company's property—(loud cheers)—but whether through Mr. Phillpotts or no he could not say.

A Shareholder: Refund, Mr. Applegarth.

The Chairman said he did not think Mr. Applegarth was called upon to refund. He did not believe that the property was sold at too much money, but it was sold at a time when it was impossible to work it, and it required a great deal of money to be expended before any returns were obtained, but the company was really in a harbour of bliss compared with what it was when the present board first took charge of the affairs of the company. He himself had had serious misgivings. He had consulted the board of directors, and had said that the concern appeared to be too vast and too heavy to carry on in the way it was being carried on. It was possible that Mr. Phillpotts was not the man; it was possible that he himself had not the ability to know who to direct the company, and see how to save expense. (No, no.) He had mentioned the subject to Mr. Applegarth in full confidence, and had said that if it would do the company good he would place the resignation of himself and friends at the board at the disposal of the shareholders, on the one condition that they would bring in honourable and upright gentlemen to take their places on whom he could depend. (Cheers.) They tried negociations with Mr. Ridsdale, who was a man of character and position, but he would not take the helm. The charges which had been brought forward were unworthy of Mr. Baxter and his position, because that gentleman was manifestly an advocate of Mr. Applegarth.

Mr. Baxter: I disclaim that.

The Chairman said that what the board had asked was that they should not discharge Mr. Phillpotts in a manner which might lead to injury and mischief hereafter, but to have him home, and to hear his explanations, and he would pledge himself to obtain Mr. Phillpott's resignation if the shareholders were not satisfied with that gentleman's explanation. He had declined to ask for any proxies for this meeting. He had done his duty, and he asked the shareholders not to place difficulties in the way of the board, but to work with them for the protection of the interests of the company. (Loud cheers.)

In answer to a remark by Mr. Baxter,

The Chairman explained, with respect to the telegram which had been received respecting the contract between Mr. Phillpotts and Mr. Goodfellow, that he presumed at the time that the South Aurora Company had received a duplicate of that telegram, and had at the earliest opportunity called upon the Aurora Company to congratulate them upon the contract having been entered into. He added, that he seemed to have pleased no one; he did not please the South Aurora Company because he did not give enough, he did not please Mr. Taylor because Mr. Taylor was a South Aurora man, he did not please Mr. Applegarth because he had taken 1000 shares from that gentleman, but he had pleased himself, and he had pleased the board, and now the affair rested entirely in the hands of the shareholders to do as they liked. With respect to the 5000*l.* due to Mr. Applegarth, he was sorry it had not been paid before. It was an obligation of the company, and ought to have been met, and it was only the dire calamities and misfortunes which had happened to the company which had prevented it being paid before. However, he could stand up and say that that was the only thing connected with the whole affair on which any single shareholder could hold up his hand against the bad management of the company. (Cheers.)

Mr. Pearless said that the great proportion of the shares which stood in his name belongind to Mr. Applegarth, but it was difficult to say the exact proportion, as there were other vendors: and Mr. Applegarth had been obliged to place a large number of shares upon the market entirely because the company was not able to pay the money which was due to him. All the shares which had been sold were not Mr. Applegarth's: he sold some of the shares for Mr. Crawford. There was nothing illegal in selling the shares—(Hear, hear)—the mine was sold principally for shares; and he believed the board had done everything in their power; but he had impressed upon the board the necessity of changing the management. He was satisfied they were paying too much for mining and crushing—it cost almost $34, when it should be done for $20. He believed that Mr. Phillpotts was an honourable man, but he did not understand mining and milling in the country. When Mr. Attwood was in charge he made a much better return than had been obtained since. Mr. Attwood gave 85 to 86 per cent. After Mr. Attwood left the assay got down to 75 per cent. He believed that the running of the Oasis Mill for a short time was a great piece of mis-management; he and Mr. Haggard were the only ones on the board who stood againft it; at length they agreed that if Mr. Phillpotts could work it a profit he should be allowed to do it. They never heard a word on the subject from Mr. Phillpotts for three months, and when the accounts were sent in the Oasis Mill showed a loss. There were other reasons for the removal of Mr. Phillpotts; but it was a subject which had better be left to the directors. He believed Mr. Phillpotts to be a man of honour and integrity, but not capable of managing the property. It would be wise on the part of the shareholders to retain the present directors; and let Mr. Phillpotts meet the shareholders at (say) a month from that date, and then they would be able to decide whether he was an efficient man or not.

Mr. Phillpotts: There is no gentlemen here so eager to meet the shareholders as Mr. Phillpotts.

Several gentlemen appealed to Mr. Baxter to withdraw his amendment, but he declined to do so.

The amendment was then put and lost by a large majority.

Mr. Baxter demanded a poll, which was granted.

Some of the shareholders demanded that the poll should be taken at once, but the Chairman pointed out that there were 1200 shareholders, and only about 250 were present, and said it was only fair that those gentlemen who were absent should have an opportunity of expressing their opinion. He, therefore, appointed Tuesday next for the taking of the poll, at the offices of the company, between the hours of 10 and 4, but for the convenience of the gentlemen present the poll was at once opened in order to afford them an opportunity of recording their votes.

The meeting was then adjourned (to a day to be named by the directors), to announce the result of the polling.

WHEAL GRAMBLER MINING COMPANY.

At a special general meeting of adventurers, held at the mine, on Tuesday (Mr. W. P. Cardozo in the chair), four months cost was brought forward, ending Sept. 12, showing a balance against the adventurers of 341*l.* A call of 1s. 6d. per share was made. The agents, Capts. W. and J. Tregay, reported as follows:—

The lode in Sir Frederick's shaft is large, and produces good stones of tin. In the rise from the deep adit, under this shaft, the lode also produces good stones of tin. In the back of deep adit, about 15 fathoms east of this, there is a rise and stope, where the lode is worth 20*l.* per fathom for tin, which we shall be enabled to work on tribute as soon as ventilation is effected by communicating this shaft and rise, now 8 fathoms distant. On the gossan lode, near St. Day road, we have sunk a winze 5½ fms. below the adit, and find an exceedingly kindly lode, producing a little tin, and promising for copper ore. We have sunk a shaft on the south lode in order to open the deep adit level, and to prove the lode now down 15 fathoms: the lode here has a kindly appearance, and produces good stones of copper; this lode has produced in the neighbouring mines good courses of copper ore near the surface, and we believe we have a good prospect in it. In the north part of the sett we have a very large gossan lode, where we have put down a shaft 20 fathoms to prove it, and opened some distance on its course; this is a very fine lode indeed, and produces occasional stones of grey and black copper ore. We believe we have not to sink far here before making a valuable discovery, as it has every indication of productiveness. We recommend pushing through Sir Frederick's shaft, and opening the tin ground there; at the same time prosecuting the present trials of the other lodes, especially the large gossan lode in the north sett, and we believe this course will lead to early success.

LINARES LEAD MINING COMPANY.

The half-yearly general meeting of shareholders was held at the company's offices, Queen-street-place, on Thursday,

Mr. William Cox in the chair.

Mr. H. Swaffield (the secretary) read the notice convening the meeting, which the Chairman then declared to be duly constituted, and the directors' report and statement of accounts were submitted.

The directors reported that there had been a profit of 5889*l.* 1s. 10d. on the mining operations during the past six months, and a profit of 416*l.* 19s. 9d. on purchases of lead ore—together 6306*l.* 1s. 7d. For the half-year to Dec. 31 the profits were—on the mines, 2029*l.* 2s. 2d., and on ore purchases 315*l.* 5s. 7d.: total, 2344*l.* 7s. 9d.; therefore, the accounts now presented show a highly favourable result. The increase in the profits has mainly arisen from the improvement in the lead market. The directors stated in their last report that the price of lead had at that time risen from 17*l.* 10s. per ton to 19*l.* 5s.; since then the market has further improved to 20*l.* per ton. Large contracts have been made at prices varying from 19*l.* 10s. to 20*l.* per ton, and these will ensure a good result on the present half-year's workings. The quantity of ore raised from the old mines has averaged 208 tons per month, and the reserves of discovered ore are now estimated at 250 tons, which shows a diminution of 250 tons since March last. Mr. Tonkin is afraid, therefore, that the returns of ore may fall off after December next.

The Quinientos Mine has yielded a return of 75 tons of ore per month, and the reserves are again estimated at 1400 tons. The ores from this mine contain a larger quantity of silver than the ores from Pozo Ancho Mines, and this gives the Quinientos lead an increased value to the extent of about 1*l.* per ton. The new engine provided for this mine was set to work in July last. This engine will effect an important economy in fuel, and will furnish the necessary power for proving the mine to a considerable depth.

The smelting operations have been carried on at Cordova with the usual good results, under the superintendence of Mr. Duncan Shaw. There has been a small increase of 1s. 1¼d. in the cost per ton of ore smelted, caused by the higher price of fuel. Both the mines and the smelting-works are provided with good stocks of coal, which were purchased before the recent great rise in price had occurred. The lead has been shipped to England with great regularity, the quantity remaining in Spain seldom representing more than two or three weeks' make. The result of the "purchased ores account" is satisfactory, and the directors will be glad to extend this department of the company's business as they are able to do so. The competition for mineral, however, has lately become so great in the Linares district that it is difficult to effect purchases at the moment at remunerative rates. The lead market continues firm. The stocks of lead in England in the hands of merchants appear to be smaller than usual, and as the arrivals of lead from Spanish ports have for some time past been on a reduced scale there is reason to believe that the present price of lead will at least be maintained, if it does not advance. The reports from the officers at the mines were appended, as usual. There was a balance of undivided profit on profit and loss account of 6317*l.* 2s. 10d., out of which the directors paid the dividend of 5s. per share just received by the shareholders, and wrote off 1270*l.* 9s. 9d. for the balance of cost of the Quinientos new engine, leaving 1297*l.* 3s. 1d. to carry forward to credit of next account.

The Chairman said that it became his duty to submit the first and only resolution—that for the adoption of the report and accounts. It was a matter of congratulation that they had been enabled to pay the usual dividend of 5s. per share, and that this half-year they had, in addition, 1297*l.* 3s. 1d. towards the dividend to be paid next March, when he had no doubt they would be in a position to pay the same amount as they had paid now. They would observe that they had written off the residue of the cost of the Quinientos engine, and for this he had been called to task by some of the shareholders, who thought they need not have written off so much; but he would remind them that after the resolution authorising them to expend 7000*l.* on the Quinientos Mine they found that the prospects were all they could wish, it was still necessary to lay out an additional 2200*l.* for an engine, &c. They had written off 1000*l.* previously, and by writing off the remaining 1270*l.*, all the work at Quinientos remained still at the 7000*l.* which they were authorised to spend some years ago; they had also a good asset in the engine. As to their future prospects, he had referred to them as far as March next. How long they would continue to prosper beyond that would depend upon circumstances. Pozo Ancho had not yet given out as it was considered possible it might do two years since, and there was much there which it would be worth while to take away at present prices. Quinientos had at this moment 1400 tons of discovered ore in it, and they had been taking out at the rate of 75 tons per month. The engine had now gone to work, and they were making good discoveries, so that he confidently expected that the Quinientos Mine would enable the company to pay good dividends even when Pozo Ancho was exhausted, whenever that might be. He concluded by formally moving the resolution.

Mr. Peill seconded the motion.

Mr. John Taylor would be happy to answer any question, but thought their duty was at present simply of a congratulatory kind. The old mine had shown extraordinary powers of endurance; they found ore for a longer period than was anticipated, and the monthly report read at the board to-day stated that the Pozo Ancho is yielding 200 tons per month. The upper levels have become valuable in the last few years in the western part of the mine, and the deeper levels in Warnes' had also improved. The Quinientos, which is 3 miles from this, is opening up very satisfactorily, and there are great advantages in working it, such as comparatively soft ground, and so on. It really seemed to him that before the old mine was exhausted they would have a good mine in Quinientos in reserve. They had had great good fortune to be able to maintain their dividends, and as lead had risen from 17*l.* 5s. and 17*l.* 10s. to 20*l.* 5s., and to-day they could have sold at 20*l.* 10s. if they had thought fit to do so, they need not fear for the future. The lead market was decidedly firm, and the 3*l.* per ton difference enabled them to open levels which would otherwise be shut up. All the works were being carried on in the most economic way. Spain had had excellent rains, so that the prospects for the winter were good. They had a good set of miners, and as they were paying them liberally they were quite contented. The levels stretching into the new land are looking well, but at present there was no reason to be over-sanguine, although they were certainly not without hope.——The motion was then put to the meeting, and carried unanimously.

Mr. Thomas Sopwith, jun., in reply to questions from other shareholders, stated that if the high price of lead now obtainable were to cause a few of the small mines in the neighbourhood to start it would not take away more than a dozen men or so, either from his mines or from those of the company.

The usual complimentary vote of thanks was then given to the Chairman and directors, and the proceedings terminated.

ALAMILLOS COMPANY.

The half-yearly general meeting of shareholders was held at the company's offices, Queen-street-place, on Thursday,

Mr. J. P. Judd in the chair.

Mr. H. Swaffield (the secretary) read the notice convening the meeting, and the directors' report and statement of accounts for the six months ending June were then submitted.

The directors stated that the operations which have been carried on at the mines during the six months ending June 30 last have resulted in a profit of 3625*l.* 4s. 6d. This compares favourably with the profit of 1759*l.* 18s. 1d. realised during the previous half-year, the increase amounting to 1865*l.* 6s. 5d. The mining expenditure has been kept as low as possible, consistent with the efficient working of the mines, and a small reduction has been effected under this head. On the other hand, the raisings of lead ore show an increase of 16 tons 13 cwts. per month, as compared with the past half-year. This increased rate of extraction has been maintained without trenching on the reserves, the quantity of discovered ore in the mine being again estimated at 2500 tons. The exploratory works continue to be pushed forward vigorously, so as to open out new ore ground as the old levels may become exhausted. The results of these explorations, and the general appearance of these levels, are such as to encourage the hope that the present rate of extraction will be maintained. Prior to the recent rise in the price of coal the directors took the precaution of laying in a large stock for the steam-engines. The consequence has been that the extra cost of fuel during the past half-year has been unimportant, and the stock now on hand will last through the winter. It will be seen by the smelting report annexed that the cost of smelting has varied but little from that of the previous half-year. The costs for the six months to Dec. 31 were 1*l.* 5s. 1d. per ton of ore, whilst those for the six months to June 30 were 1*l.* 5s. 2d. Against this small increase in the working cost has to be set an increased produce of lead from the ores. The lead market has been very firm during the entire half-year. At the last general meeting it had reached 19*l.* 5s., and is now firm at 20*l.* per ton. The directors have been enabled to declare the increased dividend of 1s. 6d. per share, against 1s. per share in March last, and they have written off 500*l.* from the account, "Outlay on Mine Works." After debiting the profit and loss account with these sums, there will remain 618*l.* 12s. 10d. to carry forward to the next account.

The Chairman, in moving the reception and adoption of the report, remarked that the meeting would see that his duty was merely a question of congratulating them on the report. They had had increased returns, increased profits, and the same amount of reserves. They were obtaining better prices for their lead, and had wiped off 500*l.* from their mines works account. He thought they had an excellent prospect of increased dividends; but as to the position of the mines themselves, Mr. Taylor would give them more information than he could; he would, therefore, merely move the resolution.

Mr. Taylor said that the mine had in several places been opening out very satisfactorily, though many of the levels were not so rich as they could have wished, but they have, nevertheless, opened up some very good ground, which had laid open four parallel lodes. They had a great length of ore ground within their boundaries, and they hoped gratually to extend their workings. The mine was well supplied with machinery to enable them to go down, and the western part had much improved within the last few months. They had made a better profit in the half-year, and there was no fear of falling off; indeed, he quite thought they might hope for improvement. In the part called Magdelena, to the east of the engine-shaft, they had a great improvement in depth, and had had much ore there in the upper levels.

Mr. T. Sopwith, jun., enquired whether it was the 75 fm. level to which he alluded, and what was the latest valuation?——Mr. Taylor said that it was. They had had 6 or 7 tons per fathom in the upper levels; then the ground become poor, but there had now been a great improvement, and they had from 2 to 2½ tons to the fathom.

The report and accounts were then unanimously adopted, and the proceedings

terminated with the usual complimentary vote of thanks to the Chairman and directors.

FORTUNA COMPANY.

The half-yearly general meeting was held at the company's offices, Queen-street-place, on Thursday,

Mr. ROBERT HENTY in the chair.

Mr. H. SWAFFIELD (the secretary) read the notice convening the meeting, and the directors' report and statement of accounts to the end of June last was then submitted.

The directors reported that the result of the past half-year's operations has been very satisfactory. The profit of 10,216*l.* 12s. 6d. is greatly in excess of that of the preceding six months; indeed, it is the largest profit made in any similar period since the formation of the company. The advance in the price of lead, which took place early in the present year, is the chief cause of the increased profit now shown, the prices obtained for the half year's produce having been 19*l.* 10s. to 20*l.* per ton, whereas the bulk of the lead produced in the half-year to December last did not realise more than 17*l.* 10s. per ton. A reduction of 1215*l.* 10s. 9d. in the mining expenditure has also been the cause of an increase of profit. This reduction has been effected without lessening the raisings beyond about 3 tons of ore per month, while the exploratory works have been pursued as actively as ever. Improvements in the smelting department have likewise contributed to enhance the profits, and the directors feel that great praise is due to the superintendent for bringing this department into its present state of efficiency. The produce obtained from the ores has been larger than at any previous time, and this result has been accomplished without a corresponding increase in the cost of working. The carriage department has been conducted with regularity during the six months, and there have been no accumulations of stocks of lead in Spain. The carriage prospects for the coming winter are encouraging, as the new cart-road between the town of Linares and Buera station will, it is expected, be opened for traffic in the course of a few weeks. The mines are well provided with coal for the winter, a good stock having been accumulated at the mines during the summer months. This coal was purchased at lower prices than those now ruling. The prospects of the undertaking for the future are very encouraging. The mines continue productive, the raisings of ore average nearly 400 tons per month, and the reserves of discovered ore are estimated at 8300 tons. Lead continues firm in price, with an upward tendency; the last sales were made at 20*l.* per ton. The profit and loss account showed a balance of undivided profit of 10,261*l.* 10s. 11d., out of which the dividend of 5s. per share (being an increase of 1s. 6d. per share compared with the April dividend) was declared, and 1000*l.* was written off from plant account—leaving 3011*l.* 10s. 11d. to carry forward. The reports of Capts. Tonkin, Curtis, and Henty gave details of the various operations at the mine.

The CHAIRMAN said the only resolution he had to propose was that the report and accounts be received and adopted. In doing this he had very little to say, because the report pointed out so fully the favourable position of the mine and the profits realised. It happened on the present occasion that they could scarcely say too much of the prospects, but as he disliked to be oversanguine he would leave the report to speak for itself. They had written off 1000*l.* from plant account, and no doubt some shareholder might enquire why they retained so large a balance; he would, therefore anticipate the enquiry by explaining the motive of the directors for retaining so large a sum. The directors and company had been hampered by want of floating capital, the amount had, therefore, been retained to avoid similar inconvenience for the future. He hoped they would not have to touch it, but this would in a great measure depend upon the price of lead. They had a good stock of coal, and there was almost the certainty of the road being finished in a few weeks, which would much facilitate the removal of ore from the mine. The smelting works had been carried on most satisfactorily, and he was sure the shareholders would agree with the directors that nothing could exceed the zeal displayed by the manager. The reserves were about the same as at the last meeting. There had been very little diminution, and the price of lead was decidedly on the advance.

Mr. BIGGE seconded the resolution, which was put to the meeting and carried unanimously.

Mr. TAYLOR had great pleasure in speaking of the position of the mine and the financial position of the company. Some time ago they borrowed 15,000*l.* on debentures, all of which was now repaid, and he believed it was the fact that money had been well applied that had contributed to place the mine in its present position. The mines might be considered to form four parts, all of which were looking better than ever. Los Salidos is very productive, and is an excellent mine. Canada Incosa had fluctuated much, but there were two or three points, especially about Lowndes's part, which had much improved. They had been driving a cross-cut at the 80, to intersect a south lode, and this was looking well. At San Pedro, in the 60, the lode was also looking well, and coming towards the cross-cut they had ground worth 1½ ton to the fm. They were opening up a new vein in Canada Incosa. In the east, which was usually poor at first, there had been a great improvement, and they were now producing good work. There was also a pertenencia called La Graciosa, adjoining Quinientos, belonging to the Fortuna Company, and in Palgrave's shaft going down here under the 35 fm. level they were getting some good ore. They would open out this part as rapidly as possible. It had occurred to them whether they should drive the cross-cut, going towards the cross-course, to reach the Graciosa vein at greater depth. This cross-cut would give drainage to all that part of the mines. The question was under discussion, but they had not yet quite come to a conclusion upon it. They had thus the Graciosa, Salidos, Canada Incosa, and this south vein, which all looked well. They were supplied with coke at 13s. per ton instead of 40s. or 42s., f.o.b. at Newcastle, which was now the quotation. Lead had become somewhat scarcer, and as the demand continued he thought they might have confidence that prices would go higher.

Thanks were voted to the Chairman and directors; and, in acknowledging the vote, the CHAIRMAN remarked that few shareholders could have any idea of the difference of the feelings with which directors presented accounts such as they had had to-day, and those of an apologetic character. The difficulty he thought at the present moment was to refrain from inflation.—The meeting then separated.

PINTO SILVER MINING COMPANY.

A special meeting of shareholders was held on Thursday, at the offices, Cannon-street (Mr. C. N. CRESSWELL in the chair), to consider the position of the company, and the best means of carrying on the operations in future.

The CHAIRMAN said the minutes of the last meeting indicated the exact position of the company at that moment, and what he had now to tell the shareholders would indicate the position of affairs at the present moment. The shareholders were aware that the directors had entered into a professional arrangement with the proprietors of the mines immediately adjoining this company's mills on what the directors considered advantageous terms—the payment of the purchase price in paid-up shares of the Pinto Company as soon as it was ascertained by practical working that the property was valuable. The term of 12 months was given to ascertain by the most tangible proofs that the property was valuable. That agreement was entered into on the part of the vendors as persons largely interested in the Pinto Company, and desirous of assisting in its resuscitation. The resolution empowering the directors to raise a sum of money on mortgage debentures was carried into effect some days after the last meeting, and circulars were issued asking shareholders to subscribe, but only two gentlemen responded, offering to take debentures to the extent of 300*l.* Such being the case, the directors gave orders to stop the operations at the mine. The bankers in Eureka, who had advanced nearly 5000*l.*, became pressing for something on account, but it was not until the end of September that the directors received a definitive summons to pay up. By great exertions on the part of the directors they raised sufficient money to pay the bankers 1500*l.* on account, and with the limited means at their command they began to develope the property, and some few thousands of dollars were expended, the results of which had been detailed by the superintendent, Mr. Plater. The advance was made by the directors and their friends on the security of the mortgage of the property, at interest of 20 per cent., which was somewhat below the interest paid in Nevada, where 23 and 24 per cent. was a usual rate. Believing that during the past two months the shareholders had had an opportunity of reflecting on the position of the company, the directors thought it better to call the present meeting, and lay before them the exact condition of affairs, which he certainly thought was more encouraging than at the end of July. A gentleman who last year gave the directors the benefit of his opinion had stated it would be suicidal to abandon the property in the present condition, and had offered to go himself, and take somebody with him, to confer on the best mode of developing the property. The next question was whether it was not worth while to venture another 10,000*l.*, which would be applied partly to paying off the debt, and then release the mill, and partly to developing the newly-acquired property. He would read some extracts from a letter which had been received from Mr. Plater, dated Sept. 23, which would show the position in which the property now was. Mr. Plater wrote:—

"Yours of the 5th received to-day. I regret to learn the difficulty experienced in raising funds for the further prosecution of the work here, but the matter to be decided by your shareholders is whether they will abandon the property for the amount due—say, 5000*l.*—or continue the business by subscribing additional capital. I can but express myself somewhat surprised, even in the worst view of the case, that your shareholders will consent to give up this property rather than advance $1 50c. per share for its retention. Leaving out the mines entirely, we will place a valuation on mill and appurtenances; without any reference also to water location, water-pipes, tanks, and numberless other conveniences which are indispensable, and must add something to its value:—3100 lbs. quicksilver at 80 c., $2480; wagon, harness, team, $800; assay-office and fixtures, $600; dwelling-house, $1000; blacksmiths' and carpenters' tools, $100; 100 tons ore, at $100, $10,000: total, $14,780; balance for 20 stamp mill and furnace complete, $11,220: total, $26,000; 18,000 preference shares, at $7 50c., $27,000. As a business proposition, then, such a course is suicidal; and yet it seems your shareholders are really contemplating it, for this must be the result of a refusal to supply funds.

Custom Ores: Small lots of these are now offering, and, were we running, there seems every reason to believe the supply would be good. A few days since a mine-owner desired to know when I could reduce 200 or 300 tons for him. Situated as I am at present, I can make no answer to such enquiries, for, being entirely without means, I am unwilling to contract any obligations, and freight must be paid, as well as wood, coal, &c., all of which are cash upon delivery, or on the first day of each month. Had the debt been paid a month or two since, I believe, with the credit I would then have had, I could now lay in from all sources. There has just been a discovery made near Basye of a body of ore of considerable extent, which will furnish a number of hundred tons to us in a short time, and which cannot be taken elsewhere except at great cost. The discoverer, being unable to pay for an assay, brought the sample to me, and I would only make it conditionally on being shown the property. I found him correct, so far as quantity goes, and that there really is on the surface 100 or 200 tons, with a good prospect of finding more. The situation is good, being little more than 2 miles from the mill, and very accessible. The ore averages by assay $120, and as he can mine it for about $5, I shall be able, perhaps, to buy it outright for $30 or $35 on the dump, which will leave us a good profit for milling—say, $50.

I mention such things to show you that our mill property must in time be most productive, and could demonstrate this clearly to anyone on the ground, but, as in a former letter, would recommend no effort to be made before another spring, although had I the means at hand now I would still make an effort to run during the greater part of the winter at least, and think it could be done by pressing as many teams as could be found; and then the road towards Basye never has been very bad in former years, and we might haul up to February.—Paige and Erwin: Shaft continues in same formation, without ore, the small seam continuing to come in and go out as before noticed.—Basye: Ore in shaft, last assay, $176; formation becoming softer; cannot yet determine either pitch or dip of ore body, both having changed during past week. Face of tunnel somewhat softer, showing quartz in small quantity."

The CHAIRMAN went on to say that the directors were of opinion that it would be advisable to raise 10,000*l.* to work the property. There were 150 tons of ore lying fit for the mill at Basye Mine, and 100 tons at the Basye Mine, and there was a large quantity of customs' ore, which, if the company had sufficient means, might be worked at a profit. The company possessed a large territorial property, and a valuable water location In conclusion, the Chairman formally moved the following resolution:—"That the directors be authorised to raise the sum of 10,000*l.* by an issue of mortgage debentures, bearing 20 per cent. interest, upon such terms as they may deem expedient, for the purpose of paying off the temporary loan of 5000*l.*, and providing further working capital."—Mr. BEWICK seconded the resolution, and said that it would be injudicious to abandon the property at the present moment.

The CHAIRMAN, in answer to a question, said that the whole of the company's capital was paid-up, and therefore it was necessary to raise the money on the terms proposed.

A SHAREHOLDER expressed his opinion that if the property was worth working it was worth working for the company; at the same time, he was disappointed that no silver had been received from the mine.—Mr. BEWICK said the shareholder was mistaken—4000*l.* worth had been received.

The CHAIRMAN said that the company's mill cost 16,000*l.*; but now, in consequence of the increased price of materials and labour, it could not be built for 27,000*l.* If they had the means to start the mill there was sufficient ore to keep it going for some time.

Mr. BEWICK, in answer to Mr. Smithers, said he had sufficient confidence in the property to recommend the shareholders to adopt the course now recommended by the directors.

After some further discussion, in which several of the shareholders expressed their approval of the directors' recommendations, the resolution was put to the meeting and carried, with the addition of the following words:—"Provided that no allotment of debentures be made unless 7000*l.* of debentures are subscribed for."

The meeting then separated.

SOMORROSTRO IRON ORE COMPANY.

The statutory meeting of shareholders was held at the offices, Austinfriars, on Thursday,—Mr. GEORGE BATTERS in the chair.

The SECRETARY read the notice convening the meeting.

The CHAIRMAN said the business of the meeting was purely formal in character—the election of directors and auditors. He had the pleasure to inform the meeting that the capital had been subscribed, that the mines had been paid for, and had been in possession of the company for some time. The whole of the shares applied for had been paid up in full, and the company's financial position was a very sound one. The directors had not discounted one single bill, and they were not aware that there were any debts whatever; 150 shares remained unalloted, and the directors hesitated to allot them, believing they ought to command a much better price than par. He did not say they would not be allotted, but that it was a question with the directors whether they should allot them or not. The capital expended up to the present time by the company had not yet been in any way productive, inasmuch as the tramway was not completed; so that the primitive and expensive mode of bringing the ore down from the mine had been continued; but in face of this manifest drawback the directors were able to show a profit sufficient to enable them to declare a dividend of 2*l.* per share upon the four months' working. (Hear, hear.) It must be regarded as an interim dividend, the directors having arrived at the fact by a rule of thumb from the outgoings and incomings that they were in a position to give the dividend which he had now the pleasure to announce. (Hear, hear.) They hoped to do very much better in the future, but they were yet young, and the natural inference was that having been able to do this without the economic aid of the tramways, &c., they might fairly expect much more satisfactory results when they had the advantage of steam, and bullock drays and mule carriage were done away with. Since the company took possession an important contract had been made with the Wire-tramway Company to make a tramway for 6000*l.*, capable of bringing down 500 tons of ore per day from the Mora Mine to the turnpike-road. Considerable progress had been made with the works, and Mr. Hodgson, the patentee, had sent a message that morning that he calculated it would be completed in a month. The contractor had left a large portion of the money in the hands of the directors until it had been proved the tramway was capable of bringing down the stipulated amount of 500 tons per day. From the turnpike-road to the river would be another section of about the same length of two miles, and would cost about the same amount (6000*l.*), and when that was completed they would be enabled to ship ore down the river and convey it to England. The inclined plane for the transit of the ore from the Malespera Mine would be complete in a fortnight or three weeks, and the Northern of Spain Railway had put down a siding, so that bullock drags would shortly be done away with. A compact had been entered into for bringing down ore for a series of years at a cost of 7½*d.* per ton. The depth of water at Bilboa was not sufficient for vessels of large tonnage, but lower down the river there was draught equal for any size ships. In winter 300 or 400 tons per day would be brought down, there being a greater competition for carriage in summer, and the railway not well provided with rolling stock. The Ollargan and Malespera Mines were very large deposits—so large that those accustomed to the ordinary veins in this country could form no idea of their magnitude; the deposits comprised many millions of tons of ironstone—indeed, it was literally a mountain of iron. Certainly in the lifetime of the present shareholders no sinking would be required. The ancients worked away the soft ore by means of galleries, leaving millions of tons of hard ore—this was being shipped to this country, and had proved a very valuable ore, yielding from 50 to 60 per cent. of metallic iron. The Mora and L'Union were close to each other, and contained deposits of a character altogether different from any ore known to exist in this country in any considerable quantity. They knew it was of very superior quality, yielding 60 per cent. of metallic iron, without any phosphorus or sulphur, and well adapted for the manufacture of Bessemer pig, and for the highest class of iron. They believed there was nothing in Cumberland to excel it, and there were certainly at least 50,000,000 tons of this class of ore to work out at the Mora and L'Union mines. Local smelters in bad times, when ordinary iron ore could be obtained for almost asking for it, gave 10s. to 12s. per ton for this high class ore. The company had no royalty to pay, and the mines were all freehold. In order to satisfy themselves as to the quantity and richness of the ore, and the facility for working it, he (the Chairman) had visited the property several times; Mr. Carr had also been there, and Mr. Richardson, who was largely connected with the iron trade; also Mr. Darby, of the Ebbw Vale Company, and Mr. Norris, of the Colebrookdale Company, all of whom had satisfied themselves of the truth of what he (the Chairman) had stated. As to the future of the iron trade, that was a mystery, but there was no doubt these mines would pay remarkably well even in the worst of times. If any one present wished for further information he would gladly afford it.

Mr. RICHARDSON said the Chairman had so fully and so lucidly explained the position and prospects of the company's property that he had left little, if anything, for him (Mr. Richardson) to add. Before he visited the property he had no intention of taking an interest in it. There was no question whatever about the quantity or quality of the ore in the mines; the chief difficulty was in getting it away, and their Chairman had explained how that difficulty would be shortly overcome. Mr. Tregoning was perfectly satisfied as to the quantity, and Mr. Darby felt assured that the mines contained enough ore to last for 2000 years—he saw enough to last them for 1000 years. Several ironmasters had properties adjoining the company's, among them Bolckow, Vaughan, and Co., John Brown and Co., and others, so that the company was not there simply as pioneers.

The CHAIRMAN, in reply to a question, said the present shareholders would be entitled to a preference if the unallotted shares were issued, but at present the directors had ample funds. The capital was raised for a specific object—to construct tramways to bring over the ore, and to purchase one or two steamers to take the ore from Bilboa to San Antonio, a distance of about 20 miles, and then to tranship it into larger vessels; but up to this time they had not derived one single advantage from this expenditure of capital. Their very excellent manager had written to say that he would be able to bring down 400 to 500 tons per day during the coming winter; if he could do that by means of the railway, and their tramway answered their expectations, and brought down an equal amount daily, the shareholders would realise very large profits. The directors had no intention of limiting the production to 1000 tons per day, for the deposits were of such magnitude if they were to work 5000 tons per day no impression whatever could be made upon them during at least the lifetime of the present shareholders. Having told them (the shareholders) all the most favourable features of their enterprise, it was but right that they should know also everything that there was of an opposite character. The Spanish Government intended to tax iron ore to the extent of 10d. per ton. A deputation was being sent to Madrid to protest against this impost, and the company's agent had been selected as one of the deputation to represent the iron mines of the Bilboa district. Should this tax be imposed it would be a settlement of the question, while the amount was very small. But there was reason to believe it would not be imposed, for according to an old statute the iron mines in Spain were free from any taxes till 1880. Furnaces were being erected at San Nicholas by an English company, who would be very large consumers of these local ores. Their own friends had provided the capital for these furnaces, therefore the prospect was most encouraging of doing a very large and remunerative local business. He looked forward with much interest to the future local consumption, for he fully believed it would become very extensive in the course of the next few years. Labour in the Basque provinces was cheap and good; they paid their men 7 or 8 reals per day.

A SHAREHOLDER asked upon what terms the contract had been made for the 1,000,000 tons of ore?—The CHAIRMAN said the contract was for a fixed price for the next ten years, at the rate of 100,000 tons per year. The terms left a very good profit over working in their present imperfect and inefficient manner. They had some very good contracts, and were realising very good prices, although not so good as they believed they would eventually realise.

Upon the proposition of Mr. C. BOWGER, seconded by Mr. R. SCOTT, the retiring directors were re-elected.

Mr. F. Catling was appointed auditor.

A unanimous vote of thanks was passed to the Chairman, for the lucid and satisfactory explanation he had given of the position and prospects of the property; and also to the directors for their attention to the company's affairs.

The CHAIRMAN, having appropriately acknowledged the vote, stated that the company were much indebted to his colleague, Mr. Carr, who was a silent worker, and a methodical stickler for having everything in proper working order; a more painstaking and reliable man than Mr. Bartlett could not be found; and Mr. Richardson's connection with the iron trade was well-known. The directors had been able to declare a dividend upon this occasion of 2*l.* per share, but he thought before another six months the shareholders would have a more substantial earnest of success. (Hear, hear.)

The meeting then separated.

DOLCOATH MINING COMPANY.

The two-monthly meeting of shareholders was held on Monday, Mr. WM. SHILSON presiding. There was a large attendance. The labour cost for the two months was 7339*l.*, and the merchants' bills 3639*l.* The tin raised was 220¾ tons 15 cwts., worth 19,559*l.* Mr. G. L. Basset's dues were 978*l.* A dividend of 1*l.* 15s. per 1-4296th share was recommended, absorbing 7518*l.*, and leaving a balance in hand of 1514*l.*

The CHAIRMAN explained that formerly 2000*l.* covered the merchants' bills, and it was owing to the increased price of coals, iron, and other articles that such a sum as now named had to be paid.

The agents, Capts. Josiah Thomas, William Provis, John Tonkin, and John Bawden, reported—

The engine-shaft is sunk 10½ fms. under the 302. The lode is producing a little tin. We have just commenced to sink a winze under the 302, east of engine-shaft, where the lode is worth for 9 ft. long 100*l.* per fathom. The 302, east of new east, is worth 50*l.* per fathom. The winze under the 290, 8 fms. before this end, is sunk 4 fathoms, and is worth for 9 ft. long, 70*l.* per fathom. The 302, west of engine-shaft, is worth 12*l.* per fathom. The old sump-shaft, sinking under the 290, is producing a little tin. The 290, east of new east, is worth 15*l.* per fathom. The 290, west of old sump, is being driven on the north part of the lode, which is worth 10*l.* per fathom. Another part is standing by the side of the level, which we cut through 3 fms. behind the end, and which is worth 60*l.* per fathom. The winze under the 278, west of old sump, is sunk 5 fms., and is worth for 9 ft. long 120*l.* per fathom. The 266, west of old sump, has reached the cross-course, on which we are now driving south to intersect the south lode. The 220, west of Harriett's, on the north lode, is worth 14*l.* per fathom. The 248, west of Harriett's, is producing a little tin. The 236, west of Harriett's, is worth 70*l.* per fathom. The 224, west of Harriett's, is worth 30*l.* per fathom. The 212, west of Harriett's, is worth 25*l.* per fm. The 238, east of Stray Park, has reached the cross-course on which the winze under the 215 is being sunk, and which is now nearly holed to this level. We expect an improvement in the lode when the 238 is driven further east. The 215, east of Stray Park, is worth 20*l.* per fathom.

Capt. JOSIAH THOMAS said the tin credited in the financial statement was not all sold. After the last account there was a drop, and they kept in their tin. Within the past two months there had been a rise of 4*l.*, and immediately this took place they sold 95 tons at the highest price—91*l.* 3s. per ton. After the Banca sale the agents thought, as did everybody else, that the prices generally would advance, instead of which they had gone down rapidly, and the managers had not thought fit to sell the tin they had. They would like to know what the adventurers thought they had better do?—Mr. WHEAR asked what quantity there was unsold?—Capt. THOMAS replied about 70 tons.—Mr. WHEAR would advise that this be kept a little longer. (Applause.)

The CHAIRMAN said the committee would like the manager to be guided by the adventurers. He would recommend waiting a little longer, and watching the market day by day.—Capt. THOMAS said the drop was very unaccountable, the Banca sale and the stocks in the smelters' hands being small. He should think the drop was a temporary one.—An ADVENTURER thought the almost complete cessation of a demand for tin-plates would account for the drop to some extent.—Capt. THOMAS observed that, besides this, some speculators in the London market had failed. The unsold tin they had credited was credited at the reduced price—86*l.* per ton. (Applause.)—It was then agreed that the question of selling should be left to the committee and Capt. Thomas, and the accounts were passed.

The REV. W. W. BUTLIN moved a vote of thanks to the agents, and remarked that, although all must hope for the rise of tin, they had much to be thankful for in their present and past dividends. (Applause.)—The motion having been carried, Captain THOMAS responded, and remarked that they must hope for better things, that the cost of coals and iron would go down, and that labour would become more plentiful than it had been. At Dolcoath they had been rather short of hands, as they had been at other mines. The mine was looking very well. (Applause.) The western part was turning out quite as well as they had any reason to expect it would, because it was a district comparatively shallow. From this part, however, they were likely in years to come to have large quantities of tin.

On the motion of Mr. WHEAR, the Chairman was thanked for presiding, and, in replying, he alluded to the able way in which the agents had conducted the works. In such a deep mine, with such an excessive cost of working, it was something to have about 20,000*l.* worth of tin raised in two months, and, although the dividends were less than at the last meeting, he though 45,000*l.* a-year, taking the present dividend as a basis, was no inconsiderable profit. He promised all the assistance he could render the mine.

BURROW AND BUTSON MINING COMPANY.

The statutory first general meeting of shareholders was held on Monday last at the offices of the Company, 47, Finsbury-circus, where an unusually large proportion of the shareholders were assembled.

The CHAIRMAN (Mr. Charles Morris, assisted by Mr. J. A. Morgan, the solicitor of the company) explained, in his well-known exceedingly clear and concise style, that this was the statutory general meeting, required to be held before the expiration of the first four months after the date of a company's registration. He gave a brief financial statement, from which it appears that the company is in a perfectly healthy condition, having, after payment of vendor, and for engines, materials, erection of engine-houses and offices, 2400*l.* cash in hand, besides 4700*l.* in balance of first issue of shares yet to be appropriated, and a second issue of 10,000*l.* at command, should it be determined to distribute the same, in which case the existing shareholders would be entitled to preference, in proportion to their interest then holding in the company. He said he expected the shareholders would be much pleased with the progress made in the works at the mines in so short a time, and, more particularly, with the prospects of early profits from the copper, silver-lead, and zinc ores, which were being raised, and of which there were already 50 tons ready for dressing.

Mr. MORGAN then read the following general report from the consulting mining engineer and resident agents:—

Oct. 12.—According to instructions received, we do ourselves the honour of giving to you herewith our general report on the progress made at these mines from the commencement, which dates from the first week in July last. We hope you will find that the work executed and preparations made up to this time, comprising scarcely three months, for the speedy and effectual resumption of these important and extensive mines, under your liberal and judicious direction, compares favourably with any undertaking of this kind. You are already aware that the old engine-house was taken down by us, and the inferior stone set apart for building offices, &c. Tenders were invited for July 16 for the building of the new engine-house and necessary offices. The engine-house is 54 feet high, 22 feet long, by 17 ft. 10 in. within walls. The main-beam wall is 5 ft. 3 in. thick, and the other three sides are 3 ft. thick. The house is covered in with best Delaboles slates, laid in lime outside, pinned and plastered with lime inside; and the whole is completed for the erection of the engine, which we hope will be accomplished in the course of five weeks.

The engine was purchased on July 2 last, at the sale at Chiverton Valley Mine, five miles from these mines. It was constructed by Messrs. Harvey and Co., of Hayle, and removed new to Chiverton Valley about two years ago. You paid only 150*l.*, less a good discount, for the engine and one 13-ton boiler. It has a 60-in. cylinder, and is in perfect working order, with all connections usually purchased with steam-engines of such magnitude. You have since purchased, for economy in coals, a second boiler of 12 tons at East Carn Brea Mine sale, used only for seven years previously, at the moderate cost of about 21*l.*, including all fittings and carriage.

Our main engine-shaft, which when forked will be 85 fms. deep from surface, is 10 ft. long by 6 ft. wide, within timbers. It is newly divided and cased from surface to adit, about 24 fms. The offices, which are completed and slate roofed, are altogether 60 ft. long, and 21 ft. wide within, comprising a smiths' shop, carpenters' shop, office, changing-room, and room for materials over. A large portion of the necessary pitwork for draining the mine is purchased at low prices, and delivered. For the purpose of expediting the drawing of stuff and dressing the ore we have just purchased a 24-inch cylinder steam-whim, with crusher attached, for the moderate sum of 498*l.*, including a 9-ton boiler, crusher, and all girders and other woodwork thereto belonging, at the Little North Downs Mine, only 3½ miles from here. It is capable of drawing from a depth of 200 fms., and the crusher is as good as new, and can be fitted with 3-ft. rollers. The necessary engine and crusher houses will be commenced immediately.

We are, in conclusion, happy to state that, from personal inspection made yesterday, we find our "black lode" is now 2 ft. wide, rich in copper and blende, with some lead and silver. We have over 25 tons of these ores in the undressed state in our ore-house, and about a like quantity in piles underground, ready to be brought to surface. The ore will require careful dressing, when such a quantity as 50 tons can be sampled, and sold to purchasers who will give a fair price for its value. We find in the course of our daily experience the statements set forth in your prospectus fully verified, and, therefore, confidently expect that when the mine is drained to the 30 fm. level we shall produce ores in large quantities. Were the crusher already erected we should find lead, copper, and blende mixed in considerable quantities in our burrows, to keep the same well supplied for profitable work.—D. R. STICKLAND; JOHN CHRISTOPHER; HENRY VON USTER, Consulting Mining Engineer.

In answer to many practical questions put by the Chairman, which proved his great experience in mining affairs, and by some of the

large number of shareholders present, Mr. Von Uster, F.G.S., the consulting mining engineer, explained that the 60-in. cylinder pumping-engine now delivered on the mine, with all its connections, is promised by Capt. Stickland to be erected and ready for starting in about five weeks from this. The ore which is now being raised, and of which 50 tons is ready for dressing, is very valuable, but of a difficult composition for dressing so that proper value may be insured for the copper, lead, zinc, and silver it contains. He said that the best authorities in the county of Cornwall, whom he consulted, agreed with him that the ore should not be treated with water, except with arrangements for saving the smalls and slime, and that it should first be hammer-dressed and hand-picked, and that each separate parcel should be submitted to a complete qualitative and quantitative analysis. Being pressed for an approximate estimate of the value of the ore in its present state, Mr. Von Uster said if he worked the mines on private account, as he had done elsewhere, and had the means of paying his men without a forced sale, he should certainly refuse 15*l.* per ton without first having it carefully assayed.

Capt. Christopher confirmed that the specimens on the table were fair samples broken by Mr. Von Uster and himself in each other's presence from the lode on Friday last; and that if the lode holds in its present state 50 tons could be raised per month, at a cost of only 30*s.* per fathom, and that each fathom would produce about 4 tons, thus leaving a large profit.

Prof. White, the well-known assayer, gave some very interesting explanations on the assays he had already made for the company, stating that he was so convinced of the highly promising character of these mines that he, for the first time in his life, bought some shares in them.

Messrs. S. E. Illingworth and Thomas Milnes were re-elected directors, and Messrs. G. Waddell and Co. auditors, at a salary of 10*l.* per annum.

Some of the largest shareholders then called the Chairman's attention to the propriety of not disposing of any of the shares remaining to others than present proprietors, and it was suggested a circular to that effect should be issued forthwith.

The Chairman promised that this should receive the directors' careful attention, when, after a cordial vote of thanks to the able Chairman and to the officers of the company, the proprietors separated, with expressions of great satisfaction with what they had seen and heard.

NORTH POOL MINING COMPANY.

The half-yearly meeting of shareholders was held at the offices of the company, Great St. Helen's, yesterday (Friday),

Mr. R. Duke in the chair.

Mr. E. J. Bartlett (the secretary) read the notice convening the meeting, also the minutes passed at the last meeting, which were adopted. The directors' report was read, as follows:—

Your directors have pleasure in presenting the half-yearly balance-sheet, made up to Sept. 20 last, showing a credit balance of 1531*l.* 11*s.* 5*d.*, without estimating other assets in property account, with a report of the local managers, Messrs. Vivian and Son, as to the progress made during the part six months, and the future prospects of the undertaking. Notwithstanding events that have occurred during the period named, in the enhanced value of labour and coal, the report is most satisfactory, and the directors are confident it would have been more so had operations been uninterrupted; but it became necessary to alter the pitwork in Ballarat shaft, and in doing so have effected a considerable reduction in the consumption of coal, and afforded increased facilities for sinking both the main shafts. The resolution adopted and confirmed to divide the sett has been communicated to the lord's agent, but having regard to the altered circumstances arising from the depressed state of the metal market, and other causes, your directors considered it prudent to take no decisive steps at present in the formation of the new company; they, therefore, instructed Mr. Bartlett, the secretary, to visit Cornwall, and have pleasure in reporting that he was enabled to arrange satisfactorily upon the point. In conclusion, the directors desire to remark that the sinkings and drivings have been making good progress for the past six weeks, without interruption, and they believe that in a short time it will yield results that will fully repay the proprietary and the executive for their patient perseverance in carrying on the works.

The report of Capt. J. Vivian and Sons was then read, as follows:—

After the meeting on April 29 last it became apparent that if we wished to make satisfactory progress in sinking Ballarat shaft, which appeared to be a point of vital importance, and to do so without making an undue cost in draining the water, a radical change must be made in the pitwork, by removing the large plunger-lift from the 24 to the 40, and by substituting a new plunger-lift for the two drawing-lifts at the 70 and 52. This has been done, and the result is that we have now no lets or hindrances in sinking: the water is drained by working the engine 1¼ stroke per minute, in place of 4 or 5 strokes, and a saving of nearly 50 per cent. of fuel effected. The alterations alluded to, which have placed us in such a good position for rapidly and economically sinking, have, however, caused delay, and will account for our now being able to report Ballarat shaft sunk only 3 fms. under the 70. We have had to notice on former occasions variations in the underlies of the lode, which we hoped would lead to its becoming highly productive of copper, such having been the case in the other great copper mines on the same range of lodes; but at present there is a greater change in the shaft in this respect than we have ever before seen, and the lode is now going down nearly vertically. With this great change in the underlie, a corresponding improvement has taken place in its whole character, the lode being now from 4 to 5 ft. wide, and containing a large proportion of soft or sugary spar, in which we are now meeting with splendid stones and lumps of copper ore (confirmed by telegram from the mine on Wednesday last). The progress which we are now making in sinking is such as will, we are assured, give great satisfaction to you and the shareholders generally, and, from present appearances, we entertain very sanguine expectations of the good results which will be developed before reaching the 80. In driving the 70 we have also been delayed whilst making the alterations in the pitwork, but during the last six weeks have been pushing on this level vigorously towards the copper ground passed through in the levels above. In our last report to you we alluded to copper ore then beginning to form part of the lode, and, although there is at the present moment not quite so much copper as then in the lode, yet its appearance is more favourable, and leads us to expect that it will be very much more productive. At the engine-shaft we have sunk to a depth of 12 fms. 4 ft. below the 25, or to within 14 ft. of the 40. The rock is much the same in character as we have reported it to be for some time, being thickly impregnated with spathose iron, blende, and mundic, with occasional seams of yellow copper ore. At the 25 the lode is 7½ fms. south of the shaft, and dips towards it at the rate of 3 ft. per fathom; consequently, should this rate of underlie continue, we should strike the lode in the shaft at the 40; but, at all events, on reaching the said level, now only 14 ft. below us, we shall be very close to the lode—say, within a few feet of it—and shall quickly intersect it by a cross-cut south. Here also the probabilities are that we shall make a good discovery, the rock being so favourable in its composition for the production of metals. Since the last meeting we have cleared a cross-cut south from the old mine at the 12, and found a lode at about 50 fms. from the old workings, and have since been driving on it west. It has been lately improving, and is now 4 ft. wide, yielding lumps of copper ore, with rich specimens of lead. This lode has scarcely any underlie, and as we are opening at the level at which the great copper formation of the old mine was discovered, exactly parallel with our present driving, the prospects at this point would seem to be good. In conclusion, we have much satisfaction in noticing that within the last fortnight or three weeks a highly favourable change has taken place in our prospects throughout the whole of the mine, rendering us more confident than before that those results which we have been so long expecting are likely very soon to be realised.—J. Vivian and Son.

The Chairman, in moving the adoption of the report, congratulated the shareholders upon the improved position, and the results likely to be realised at an early date. He also desired to call attention to the healthy balance-sheet, and he again had to thank their secretary for his usual good attention.

The reports were unanimously adopted.

After some conversation with Capt. Vivian, who was present, and afforded most pleasing information,

The Chairman remarked upon the sudden death of Mr. Jenkin, the agent to Lord Robartes, and paid a high tribute to the lamented gentleman.

A vote of thanks to the Chairman terminated the proceedings.

SOUTH CONDURROW MINING COMPANY.

A general meeting of shareholders was held at the offices, Austin-friars, on Tuesday,—Mr. John Field in the chair.

Mr. Hickey (the secretary) read the notice convening the meeting, and the minutes of the last were confirmed.

The accounts showed a debit balance of 1408*l.* 8*s.* 9*d.*

The report was as follows:—

Oct. 12.—Since the last meeting we have gone on resuscitating the mine, and, as we then anticipated, have now the pleasure of reporting all the points of operation resumed from top to bottom. In the 82 fm. level, west of King's shaft, we are driving east and west of the cross-cut by which we intersected the tin lode; in the western end the lode is 6 ft. wide, and worth about 40*l.* per fathom; in the eastern end we are carrying a part of the lode 6 ft. wide, which is worth about 25*l.* per fathom. In the 71 fm. level, west of King's shaft, we are carrying a part of the lode 8 ft. wide, which is worth about 25*l.* per fathom. In the No. 1 winze, sinking under the last-named level, now down 12 fms., and just over the 82 western end, we are carrying a part of the lode 6 ft. wide, which is worth about 30*l.* per fathom. In the No. 2 winze, sinking under the same level, at about 15 fms. west of No. 1 winze and of the 82 end, we are carrying a part a of the lode 6 ft. wide, which is worth fully 150*l.* per fathom; this winze is down 10 ft., and the lode has thus far improved with depth. In a winze which we are sinking below the 61 fm. level, at about 15 fms. before the 71 end, and now down 4 fms., the lode is 3 ft. wide, and worth about 20*l.* per fathom. The length of tin ground discovered from the 82 to the 61 fm. level, as shown by the different points already referred to, is rather over 50 fms., very little of which has yet been stoped, the principal part of the tin hitherto returned having been from above the 61 fm. level. We are now cross-cutting north in the 61 fm. level, west of King's shaft, to intersect completely the tin lode. In the 51 fm. level we are driving east and west of the cross-cut by which the tin lode was intersected west of King's shaft, and are rising and stoping in the back. In the eastern end, which is in 10 fms. from the cross-cut, we are carrying a width of about 11 ft. of the lode, which is worth about 25*l.* per fathom; in the western end the lode is 8 ft. wide, and worth about 20*l.* per fathom. In the rise and stope the lode is 8 ft. wide, and of much the same value as in the ends. In the 10, east of new shaft, the lode is 2 ft. wide, worth about 10*l.* per fathom. Since last meeting we have sunk a new shaft from the surface, west of Vivian's shaft (named Plantation shaft) to a depth of 17 fms., and extended a cross-cut from it south 15 fms., intersecting three branches or small lodes. We are driving east and west on one of these, and have opened on it altogether about 10 fms. through profitable ground, the lode being of an average width of 1½ ft., and worth about 7*l.* 10*s.* per fm. The eastern end is now worth about 7*l.* per fm., and the western end about 10*l.* per fm. Having obtained the permission of the lord of the mine, we have risen on this lode to the surface in the plantation for ventilation, &c., and find the lode about 18 in. wide, and worth about 10*l.* per fathom. There are extensive ranges of ancient miners' works in this plantation, and now that we have gained permission to break the surface we purpose opening out this part of our sett extensively, in which we think, judging from the results already obtained, we are likely to meet with valuable tin formations. We have been clearing the 10, east of the engine-shaft, on the middle lode, which has become completely filled with debris during the past winter, and having already had some tolerably good bunches of tin at and above this level, we think good discoveries will be made by pushing it further on eastward; we expect to resume driving it in a month. We shall also resume driving the 20 in the same direction as soon as ventilation is afforded by a shaft from surface. We have commenced this shaft and completed it to a depth of 14 fms., and expect to communicate it with the workings above the 10 in a fortnight from this time. We are driving a shallow adit, east from junction shaft, on the middle lode, for the purpose of laying open tin ground about the reservoir shaft. It will thus be seen that, in addition to any more extensive operations at the deeper levels, we are doing something to open up our shallow ground, where we have a great number of lodes and branches, which all, as far as we have as yet discovered, produce more or less of tin, and being in cheap ground for breaking are generally profitable. We have at the present time substituted a large pitwork for that which we previously had in use throughout our two pumping-shafts, the bottom plunger being now 12-inch. We have erected powerful shears over the engine-shaft, built two horse-whims, and made a considerable outlay in other ways to enable us to carry on our future operations effectively. The new engine is on the mine, and on Wednesday next the engineers will begin to take out the old engine. They calculate it will take nine days to get the new engine in its place and at work. During this time the water will probably rise to the 51, but if we have no accident we trust to get it out again in a fortnight from the starting of the engine. We shall then be in a better position than we have before been to render the resources of the mine available to the greatest extent; and having regard to the large quantity of tin ground already laid open, with the good prospect of continuing to make valuable discoveries, we look with confidence to giving good results in the future.—Joseph Vivian and Son, Wm. Williams, Henry Abraham.

The Chairman thought shareholders would be of opinion the accounts, both financially and those from their manager, were of a more satisfactory character than they had reason to expect when they last met; the results of the four months' working were certainly better than could have been reasonably expected, as the produce of the tin sales had more than covered the legitimate cost. Owing to the peculiar state of the coal market, it had been thought advisable to provide against emergencies by providing a stock which had cost 700*l.*, the greater part of which was intact; 663*l.* had been charged, representing one-half the cost of the engine, the bills for which would become due before the next meeting. After including those additional charges, the accounts only showed a debit balance of 1408*l.* The prospects of the mine appeared to be very encouraging; the only drawback to be encountered during the next four months seemed to be the delay consequent upon the erection of the new engine; therefore, they must reckon that only three months' returns would be available against the next four months' costs, but the committee and manager believed that a call of 5*s.* per share would be sufficient for all purposes, although at the last meeting it was calculated that 10*s.* or 15*s.* would be necessary upon this occasion. A 5*s.* call would liquidate the present debts, and it was thought probable the returns of tin would cover the expenditure of the next four months. There was a new portion of the mine which it seemed probable would aid the returns; so that, taking all circumstances into consideration, there were good grounds for congratulating themselves upon the position and prospects of their mine.

Capt. W. C. Vivian, in reply to questions from different shareholders, stated that the several points of operation were not so rich as in Dolcoath, except at one, in the winze sinking below the 71 to the 82, at a distance of about 15 fms. in advance of the 82 end, where the lode was worth 150*l.* per fm. Those shareholders who read the periodical reports published in the *Mining Journal* would recollect that that point in the last report was valued at 80*l.* per fm.; the winze was down nearly 2 fms. The lode had been opened upon for a few fathoms east and west from the 82, and the eastern was not so valuable as the western end. Easterly the lode underlies about 4 ft. per fathom, but westerly it was less. There was a distance of something like 30 fms. driven upon the ore wall of the lode.

Mr. Fraser asked if it were true that Wheal Grenville had struck the South Condurrow lode?——Capt. Vivian said it was physically impossible. Their dialler, one of the greatest authorities upon such matters, said it was impossible. The place where it was said to have been cut was 6 fms. to the south of Wheal Grenville boundary —that is, 60 fms. in the Grenville sett. He added that the 140, in Grenville, was equal to about the 110 in South Condurrow, the latter reckoning from the adit, and the former from surface.

Mr. Walter thought that, upon the whole, everything was much more satisfactory than was anticipated at the last meeting.

The Chairman thought great credit was due to Capt. Vivian for having put the mine into so much better position than contemplated. Great credit was due to him for the expeditious and effective manner in which he had succeeded in getting out the water, and also the tin.

Capt. Vivian said that, with the present prospects of the mine and the present price of tin (and he thought they might look for an advance), he believed that after the next meeting good dividends would be resumed. He calculated that during the month the new engine was being erected 10 tons of tin would probably be returned.——Mr. Marshall hoped there was no danger of the shaft running together again.——Capt. Vivian said the shaft had been made as strong as timber could make it.

A call of 5*s.* per share was made.

The committee of management were re-elected.

Upon the proposition of the Chairman, seconded by Mr. Marshall, a vote of thanks was passed to Capt. Vivian for the energy and ability he had brought to bear in the management of the mine.

A vote of thanks to the Chairman terminated the proceedings.

THE ISLAY LEAD MINING COMPANY.

The statutory meeting of shareholders was held at the offices, New Broad-street, on Tuesday,

Mr. Walter Sandell Mappin in the chair.

The Secretary having read the notice convening the meeting,

The Chairman said the present was only the statutory meeting. Sufficient time had not elapsed to have made much progress, more especially as some delays had occurred in obtaining possession of the property, arising from the peculiarities of the Scotch law. They had only had possession for three weeks, and their solicitors had very properly advised them not to incur any expense until every legal point had been satisfactorily adjusted. He (the Chairman) visited the mine last week, and carefully examined the whole of the company's property, and was much surprised at its extent, and more than gratified with its present and prospective value. Men were busily engaged in clearing the water-course, and the wheel would be ready for work in a few days. He had purchased in Ireland, on behalf of the company, a suitable steam-engine, with two boilers, which were on their way to the mine, and he had no doubt the whole would be in effective working by Christmas. In going over the property he had been very much pleased to see that it was provided with such an extensive plant, considering the small price paid for it. He was also surprised to find their property contained such large quantities of bog iron ore; he had sent samples home, which had been assayed on behalf of an eminent firm, with a view of treating for its purchase; the metallic iron in these samples was equal to 46 per cent. He thought they would be able in a very short time to obtain large results from this source, more especially as there was a company now before the public seeking a large capital for working a mine in Sydney, New South Wales, for bog iron inferior in quality to that of Islay. If they found the quantity they expected they would make very large profits indeed out of the bog iron. The directors would endeavour to carry out every detail as cheaply and efficiently as possible, and he strongly advised every shareholder to retain his interest, because he believed the shares would become of considerable value in a very little time.

Mr. Green said his impression was, supposing this bog iron turned out as expected, that a small company should be formed to work it, confining the operations of the present company to the development of the lead mine.

The Chairman said that was the precise idea of the board—that another company should be formed, the present company to receive a royalty. There were 5124 shares unallotted, and he was strongly opposed to any more being issued than were absolutely required.

A Shareholder considered it would be far better to allot a portion of the remaining shares, and place the company in possession of ample funds.

The Chairman said he wanted to keep the capital as low as possible. As far as he was concerned he would increase his stake, and perhaps it would be better to issue a few shares than make a call.

A Shareholder said he should certainly like some restriction to be made—that no more shares be issued than were absolutely required to provide funds for carrying on the works.

The Chairman said that estimates had been received for the pumps and machinery at 2000*l.*, whereas by his (the Chairman's) exertions they would get the same quantity of work done for 1000*l.*

Mr. J. Rivolta, as a large shareholder, had no objection to increase his interest. From a personal inspection of the property he was so perfectly satisfied that he should be very sorry to part with a single share.

The Chairman said the moment the mine was drained they would begin to obtain satisfactory results; and he expected by Christmas they would be in full working order. There were upon the island some 12,000 to 15,000 inhabitants, and the extent of the company's grant was more than 15 miles. He was sure that another 1000*l.* at the disposal of the directors would be ample for all purposes; and he believed in two years time the whole of the capital would be returned in dividends from the sales of lead alone. The lode could be traced for miles, and he believed, as a lead mine, it would become one of the largest in the country.

After some further discussion, it was unanimously resolved, upon the proposition of Mr. Rivolta, seconded by Mr. Green, that a circular be forwarded to the shareholders, intimating that the directors are about to issue 1000 of the unallotted shares, 695 having been subscribed for in the room.

The directors were re-elected, with thanks for past services.

The Chairman, in reply to a question, stated that the lead yielded 22 ozs. of silver to the ton, and, with one exception, was the finest in the market. The vein was 6 ft. wide, and he had no doubt other minerals would be found as soon as they were able to turn their attention to such matters.

Messrs. Lovelock and Wiffen were elected the auditors.

It was resolved that subsequent general meetings be held in February and August.

A unanimous vote of thanks was accorded to the Chairman for the great interest he had shown in the affairs of the mine, and for his conduct in the chair.

The meeting then separated.

Cargoll.—At a meeting of adventurers on Oct. 11, the accounts from Oct. 1, 1871, to Aug. 31, 1872, having been approved, a dividend of 214*l.* (2*l.* 10*s.* per share) was declared, and 86*l.* 4*s.* 6*d.* carried to credit of next account. In consequence of the abridgement of the operations of the mine the agents' salaries were reduced as follows;—The purser's, from 8*l.* 8*s.* to 5*l.* 5*s.* per month; Capt. Grose's, from 10*l.* 10*s.* to 6*l.* 6*s.* per month; Capt. Tyzzgr's, from 8*l.* 8*s.* to 4*l.* 4*s.* per month; and the services of Mr. Charles Tambyln as clerk, at 7*l.* 7*s.* per month, are to be dispensed with at the end of November next. Capts. John Grose and Robert Tyzzer say—"We are now employing 16 men underground; one hand one kibble filler, two men as smith, carpenter, and sawyers, and three pairs halvaners at 12*s.* and 13*s.* 4*d.* in 1*l.*"

West Wheal Seton.—At a meeting, on Tuesday (Mr. J. H. Bud in the chair), the accounts showed a credit balance of 1004*l.* 13*s.*, and a dividend 400*l.* (1*l.* per share) was declared, and 604*l.* 13*s.* carried to credit of next accou Mr. Oliver Matthews was appointed purser, vacant by the death of the late Mr. Matthews, at the same salary—10*l.* 10*s.* per month. The amount of copper ore s Sept. 5 and Oct. 3, to come to the credit of next account is 2927*l.* 7*s.* 3*d.* T difference on these sales is occasioned by the drop in the copper standard.

Rose United.—At a general meeting of shareholders, on Oct. 1 (Sir F. M. Williams, Bart., M.P., in the chair), the accounts showed a credit balan of 5665*l.* 17*s.* 1*d.* Sir F. M. Williams and Mr. Henry B. Fox are to be the financi committee. The purser's and manager's salaries are to be 8*l.* 8*s.* per month each.

East Gunnislake and South Bedford Consols.—At the quarterly meeting of shareholders, held at Liverpool on Oct. 15 (Mr. C. F. Carne in the chair), the accounts of expenditure and receipts showed a cash balance of 114*l.* 18*s.* 3*d.* An estimated account of payments and receipts before the meeting, to be held in January next, showed an estimated debit balance of 293*l.* 4*s.* 3*d.* A call of 2*s.* per share was made.

East Caradon.—At the meeting, on Oct. 9, the accounts for the twelve weeks ending Sept. 7 showed a credit balance of 2216*l.* 3*s.* 3*d.* A dividend of 614*l.* 8*s.* (2*s.* per share) was declared, and 1601*l.* 15*s.* 3*d.* carried to credit of next account. Capts. J. Kellow and Noah Coward reported upon the various points of operation. It was resolved that any adventurer be at liberty to inspect the mine on any day on applying to the purser for an order, and giving notice to the agents in the usual way.

Tolima.—At the meeting, on Friday, the accounts will show the net profit at the mine for the year, after setting aside, with the concurrence of the auditors, 455*l.* 1*s.* 9*d.* for possible depreciation in the realisation of the ores, amounts to 3939*l.* 10*s.*; of this sum 1175*l.* 12*s.* 6*d.* was distributed in March last as an interim dividend, at the rate of 10 per cent. per annum, on the A shares, and a further dividend on the sum at present paid up on the same, making 10 per cent. thereon for the year, will absorb 1263*l.* 17*s.* 6*d.*, thus leaving a sum of 1500*l.*, which the directors recommend should be distributed in the form of a 5 per cent. dividend on the B shares.

South Phœnix Mine—Starting the Engine.—An event of considerable importance, as affecting the working and development of this mine, took place on Oct. 11, when a powerful engine, recently erected by Mr. Loam, of Liskeard, was satisfactorily set to work, in the presence of Mr. C. Pearson, Mr. Hazeldine, and Mr. Peckover, directors; Mr. Loam, the company's engineer; Capt. Kelly, the company's agent; Capt. N. Richards, of West Caradon; and several of the shareholders. The present company have acted energetically during the year since they acquired the possession and management of this valuable property; and such confidence has been felt in the intrinsic worth of the mine that, of the 12,000 shares into which it was divided, 10,000 were readily disposed of, another 1000 were sold at a premium, and the remainder are held in reserve. The situation of the sett appears to present a guarantee as to the prosperous future of the undertaking, as the sett covers a large area on one of the Caradon hills, whose metalliferous richness is well known. South Phœnix actually adjoins the great Phœnix Mine, whose yield of tin and copper has been so immense. On the other side, at a short distance, is the famous South Caradon, and in front is Marke Valley. Other rich mines are also in the vicinity. Under the granite crust of this portion of the Caradons there are apparently inexhaustible deposits of metal, which only require intelligent and persevering mining to discover and secure. There are several known lodes in South Phœnix, some of them so large as to entitle them to be justly called "champion" lodes, which only need developing to be made a source of immediate profit. The Green Hill lode in shaft is worth 14*l.* per fathom. The engine just erected has had a second cylinder added, and is powerful enough to draw the ore and pump the water from the mine.

The New Mexico Diamond Mines.—Mr. Joseph Farren, who is a well-known enterprising mining operator, has forwarded to the *Reese River Reveille* an interesting communication from the newly-discovered diamond mining district, dated August 20:—"There have been so many incorrect accounts given through the public press of the diamond excitement, I thought I would give your readers a true statement of the facts as I find them here and on my way hither. Of the existence of precious stones here there is no doubt. As you are doubtless aware I am no diamond sharp, and therefore cannot speak confidently in regard to their value. Since I arrived I have collected several pounds of garnets, rubies, sapphires, and so-called diamonds, the latter, however, may be 'off colour' a little. I have put aside a large one for Sam Clifford's eldest son, and have a large sapphire for Judge Harmon. Tell all the old timers in Lander that they shall be jewelled from head to foot when I return. I left San Francisco Aug. 2, and arrived at Denver on the evening of the fourth day thereafter. The next morning I took the Denver and Rio Grande narrow-gauge railroad to Pueblo, a distance of 118 miles; from there took stage to Santa Fe, New Mexico, 300 miles distant, over a good mountain road and with one of the best stocked stage lines in America, owned by Sanderson and Co., who have been carrying the United States mail from Denver to Santa Fe for several years. The town of Santa Fe is pleasantly located, possesses a fine climate, with plenty of good water. The hotel accommodations cannot be surpassed anywhere in the mountains; the principal hotel in the Exchange, kept by Mr. T. McDonald, formerly of St. Louis. The inhabitants are principally Mexicans, with a few soldiers and citizens. The surrounding country is sparsely settled with stock raisers, but I predict that in a short time this will be a great stock-producing country. One of the old settlers informs me that the line of the 35th parallel railroad passes south west of here about 20 miles through a rich mineral country, consisting principally of coal, iron, and copper. From this place, a private conveyance can be secured either by horseback or buggy to Fort Defiance, a distance of some 200 miles. There is plenty of water on the route, with occasional Mexican settlements. The distance by rail and stage from San Francisco to Fort Defiance can be made in ten days. From Defiance to the mines pack mules must be used through Washington Pass for a distance of 50 miles. The country is well watered. There is a volcanic belt about 2000 feet in width running north and south, where the stones are found; they appear to me to have been thrown up and washed from the lava. Occasionally you will find them in pieces of lava when broken open. I am informed that this volcanic belt extends north to the Little Colorado, a distance of 150 miles. The mines are situated in the North-Eastern Arizona and North-Western New Mexico, and about due west from the city of Santa Fe. Your humble servant has made three locations of 160 acres each, under the late Congressional mining law, granting each name 20 acres with not more than eight names for a company or association. There is no doubt of there being a great rush to this country, even if the diamonds should peter out or a break occur in the volcanic ledge. There is a country rich in gold on the Little Colorado. I have myself seen several pieces of coarse gold with the Navajoes Indians, which they say was found there; and a person who was formerly in the employ of the Government at Defiance informs me that he has found colors of gold on the head waters of the Little Colorado and San Juan rivers. I have seen with Mexicans several fine specimens of quartz gold which were said to have been found in that locality. In the foot hills between Defiance and Wingate copper and lead are found in abundance, but of course they possess no value at present. The country over which I have travelled I consider indicates great mineral wealth. The weather is not so hot as I anticipated; most everywhere there is a luxuriant growth of grass, and water is not scarce. Nut pine abounds on high ranges of mountains, and, taken altogether, the country is a fine one. The Indians are disposed to be peaceable so far, and some of them have settled down on small ranches. Corn, which is the principal product, appears to thrive well in this soil. I am informed that on the head waters of the Black river and in the San Francisco mountains there are ancient ruins of large cities, and even smelting-furnaces have been found, which shows that mining was carried on there in past generations."

Silesian Spelter and Sheet Zinc.—Although spelter, on the whole, has rather bettered itself, and become a trifling firmer, still the improvement is only insignificant, and the price to-day for ordinary brands is 7·2 thl. to 7·5 thl., delivered at Breslau. In spite of this state of the spelter trade both the Silesian and the Rhenish works have already in the month of August found reason to raise their prices for sheet zinc by 20 sgr. per cwt., or 2*l.* per ton, which rise is fully justified by the considerably increased demand and the higher costs for rolling. Thin sheets are at present used in large quantities for purposes where hitherto tinned iron was used, particularly for the lining of cases, which makes itself especially felt in England. At the present higher price a large business is done. A rise in spelter appears almost unavoidable, and may even take place before the end of year.

Zinc.—Messrs. J. Russell, of Bonnyfield, and W. R. Hutton, of Stirling, zinc manufacturers, have patented some improvements in obtaining zinc. In treating calamine by the present invention the preliminary calcining process is entirely omitted, and the calamine is reduced to the metallic state at one operation by heating with coke or other suitable carbonaceous substance. In treating zinc-blende it is first heated or calcined in furnaces of the kind used for burning sulphur or pyrites, and the sulphurous acid driven off is led to apparatus for converting it into sulphuric acid in the usual way, so as to utilise the sulphur. The sulphurous acid is, however, led through sufficiently elongated flues or passages, or through chambers wherein any zinc oxide carried off by it may be deposited. The zinc oxide obtained by this calcining process is afterwards reduced in the ordinary way.

Puddling-Furnaces.—Messrs. R. Howson and J. J. Thomas, engineers, of Middlesborough-on-Tees, have patented some improvements in revolving puddling-furnaces. They—1. Construct the rotating chambers of such furnaces of a shape more or less resembling two truncated cones, fixed base to base, and lining the same with bricks made, by preference, of oxide of iron, ground and moulded to the proper shape and burnt hard.—2. Introducing into one end of the rotating chamber gaseous fuel mixed with air, either or both of which are previously heated in the flue or uptake of the chimney.

Steam-Boiler Alarm.—Mr. J. T. Fastre, of Paris (through Mr. M. J. Clayton), has patented a new or improved safety thermometer or alarm apparatus for steam-boilers and other purposes. The safety thermometer or alarm apparatus, which forms the subject of this invention, is based upon the combined employment of air as a dilating fluid under the direct action of elevations of temperature, and of mercury as a liquid metallic vehicle, which at a certain maximum temperature covers the points of two independent platinum wires fitted to the two electrodes of a pile. This combination, connected by the electric current to an alarum or analogous signalling device, gives warning the moment that the ambient medium reaches the maximum temperature.

The Largest Castings.—By the German papers Krupp claims priority over the big running at Woolwich. As early as 1864 four anvil-stocks were cast at that establishment weighing 3670 cwts. each, or 75 per cent. more than the Woolwich casting (103 tons). These were lifted out of the sand by tackle and manual labour, and set down about 300 yards off for anvil bases, to be worked by steam-hammers of 100 cwts. each. At the same time the Krupp works were using a steam-hammer of 1000 cwts. bearing weight, whereas the future greatest hammer of England is set down at 34 tons (680 cwts.) In addition to this, a steam-hammer of 1500 cwts. is approaching completion.

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SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

THE SCOTCH IRON TRADE—No. XIX.

THE DALMELLINGTON IRONWORKS.

The Dalmellington Ironworks, in Ayrshire, is one of the many establishments that were called into existence between the years 1840 and 1850. That decade was decidedly the most active of any in the history of the iron trade of Scotland. Previous to then the manufacture of pig-iron was carried on in Scotland on a comparatively limited scale. There were, it is true, the Carron, the Clyde, and the Govan Ironworks (including those of Calder), that had an origin dating back to the latter half of the eighteenth century; but neither of these works, under the operation of the cold-blast, could procure one-twelfth part of what they have been able to put out since the hot-blast revolutionised the rationale of the trade. To that invention the stimulus that took place subsequent to 1840 is mainly due, and although the advantages secured to manufacturers under the new *modus operandi* were most encouraging, they were set off by many and grievous drawbacks. At the Dalmellington Works, for example, there was no railway communication established with the nearest shipping ports till 1856, and the produce of the early furnaces had to be carted to Ayr, a distance of 12 miles. This necessarily involved a great deal of labour and cost that would not be tolerated for any time at the present day.

It was in the year 1848 that the first furnaces were put in blast at Dalmellington, so that the works are of comparatively recent origin. To this they owe the fact that they are, perhaps, more complete and better laid out than any other establishment of the kind in Scotland. Until the year 1857 there were only four furnaces erected, but since that time other four have been added. There are thus eight furnaces in all. Of that number seven are now in blast, and the eighth is being reconstructed in accordance with the system of Mr. Ferrie, of the Monkland Iron and Steel Works. The original promoters of the works were the Messrs. Houldsworth, of Glasgow, who also, as we have already had occasion to notice, were the founders of the Coltness Ironworks. These gentlemen have carried on both establishments with great vigour, assisted by the Messrs. Hunter, who hold a partnership in and manage the respective concerns. Mr. John Hunter is not less scrupulous to keep abreast of all efforts at economy and improvement at Dalmellington than is his brother James at the Coltness Works, and hence it is not surprising to find that at both Coltness and Dalmellington every new invention, whether mechanical or scientific, that has achieved undoubted economical results is in operation.

But the Dalmellington Works are so isolated—being apart from all other works of a similar kind—that few of our practical readers will ever have had the opportunity of seeing them. For this reason, too, they were excluded from the list of works visited by the North of England Institute of Mining and Mechanical Engineers, and by the Iron and Steel Institute of Great Britain on the occasion of these associations visiting Glasgow. Dalmellington, in fact, is in the very heart of Ayrshire, and is connected by a branch line, of which the company were the chief promoters, with the Ayrshire branch of the Glasgow and South Western Railway. The company had to wait long before they obtained railway facilities at all; but having once obtained them, they found themselves treated with the utmost consideration. By one route the company can command the shipping ports of Ayr and Ardrossan (both only a few miles distant), from which they trans-ship their iron to the Continent and America, and as their trade is mostly done abroad the great bulk of their pig-iron is sent to these ports. But they can also obtain equally ready access to the ports on the east coast of Scotland, to the Glasgow market, or to England.

The production of the Dalmellington Works is rather over 100,000 tons of pig-iron per annum. They consume upwards of 300,000 tons of coal and dross annually, and the consumption of ironstone and lime is in a corresponding ratio. There are only other two establishments in Scotland of larger extent—those being the Gartsherrie and the Coltness Works. The average height of the furnaces is 53 ft., the diameter of the boshes being 18 ft. to 19 ft. One of the eight furnaces is now being raised to the height of 80 ft. agreeably with the requirements of Ferrie's patent, which it is proposed in course of time to apply to the whole of the furnaces. This is the only establishment—apart from the Monkland Works—in Scotland at which Mr. Ferrie's patent has yet been introduced; although, as we indicated last week, the Coltness Works have also resolved to give it a trial. The new furnace at Dalmellington is in an advanced state, and will probably be blown in before Christmas.

With reference to the construction of the new Ferrie furnace at Dalmellington there is very little to be said. In all its structural arrangements and details it is closely analogous to the new furnaces erected at the Monkland Company's works, with here and there a very slight modification, adapted to the special circumstances of the works. There are different opinions entertained as to the exact height to which the furnace should be carried, and hence we find that whereas it attains an altitude of 90 ft. at the Monkland Works it will only reach 80 ft. at Dalmellington. The additional superstructure is divided longitudinally into four chambers or compartments, which descend the stem of the furnace interiorly about 25 ft., the divisional walls resting their base upon crossed arches built from the interior wall at the level of the present Scotch furnace mouth, or somewhere about 50 ft. from the hearth. This additional portion of the furnace is surrounded with circumferential flues communicating with each other. The brickwork on each side of the vertical walls is 9 in. thick, that between the inside of the retort being the same. It is proposed to fill the furnace, which will have the usual bell and cone appliance attached, on the same principle as at the Monkland Works, running the cage containing the loaded barrows on to the landing stage attached to the furnace-top, and thence emptying the charge into four hopper compartments, corresponding to the retorts. But the generation of the gases is the most striking and valuable feature of the Ferrie furnace. Their combustion can be regulated to any degree, just as the intensity is increased or diminished; and not only is there enough produced to sustain a temperature within the flues ranging from 1500° to 1700° Fahr., but a large pipe leads off the surplus gas from the top to a distance of several hundred feet, at an average temperature of 500° Fahr., to generate the heat required for the boilers and blast-stoves. It is intended to re-construct another furnace when the one now in hand is completed. The Dalmellington Company expect by the use of the Ferrie furnace to effect a saving not only of 18·93 cwts. of coal per ton of iron made, but likewise 2·36 cwts. of ores, which on such a large annual production as theirs, will represent an enormous economy. When the new furnace is ready it will, of course, be subjected to certain crucial experiments. One of the first and most important will be that of using the highly bituminous soft Scotch coal instead of the ordinary splint coal. At Monkland the soft coal has been used with the most gratifying success; and, indeed, Mr. Ferrie is of opinion that it suits the furnace better than the splint coal, which is the only quality that could formerly be used, and which, in consequence of the enormous drain made upon it for blast-furnace purposes, is now all but exhausted. The other constituents of the charge remain the same, except so far as the quantity is concerned. Practical men will look forward with the deepest interest to the experiments at Dalmellington. The Ferrie furnace has so far been introduced to the world under the favourable circumstance that the patentee is manager of the only works where it is in operation. If it realises equally good and reliable results at other works confidence in its merits will be strengthened and matured.

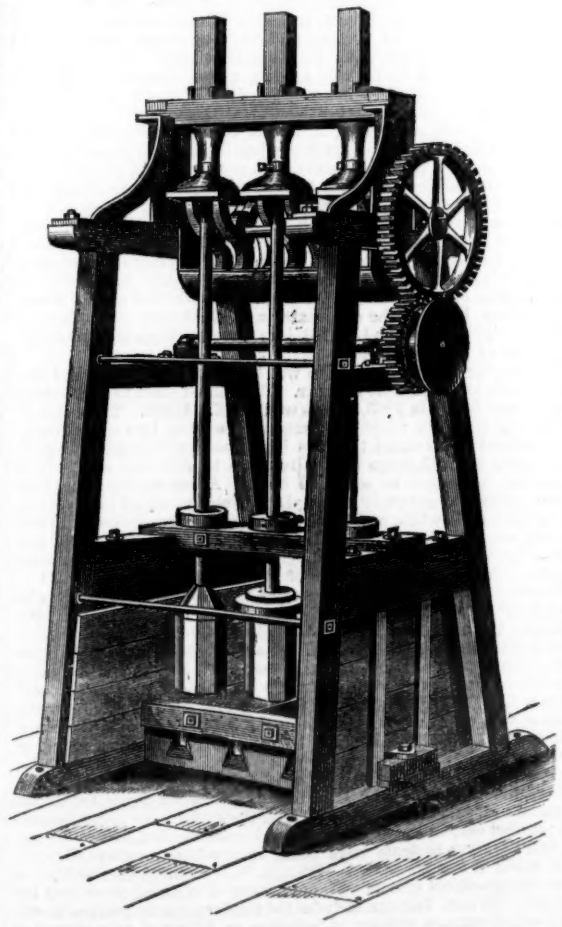
Motive power is supplied to the Dalmellington Works by four beam-engines of the largest size, and embracing many of the latest improvements. Each engine has a 100-in. blowing-cylinder. Three of the engines are usually found sufficient to actuate the machinery and supply blast to the furnaces, so that the fourth is kept idle in reserve for emergency. The boilers are of the usual horizontal description; and all the accessories of the works are arranged and constructed with an eye to the economy of space and time.

It only remains to be added that the Dalmellington Company have acquired mineral leases in Ayrshire and Lanarkshire sufficiently large and valuable to keep the works going for many years to come.

THE NEW DIRECT CENTRAL-LIFT STAMPS.

Although the number of contrivances from time to time introduced with the object of pulverising metalliferous ores more cheaply and efficiently has been very large, practical men are still unanimously of opinion that nothing has been proposed which surpasses the old-fashioned stamps. Of course, Cornishmen are not so egotistic as to suppose that the stamps in general use in the Stannaries at the beginning of the present century were absolutely perfect, and hence we find that whenever any useful modification has been proposed Cornishmen have been particularly ready to adopt it. By the adoption of these improvements in detail the quantity of power requisite for stamping each ton of ore has been materially reduced, and it is beyond question that there is ample room for further improvement. It may be accepted as a practical fact that the economy or the waste of power in a battery of stamps depends in a great measure upon the

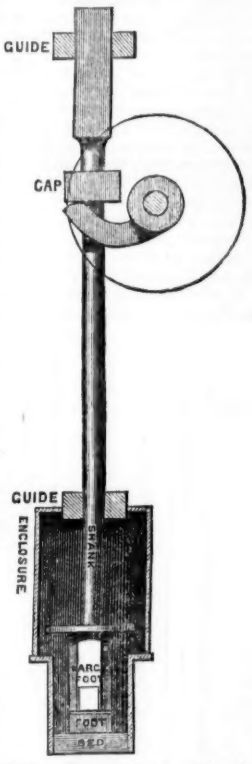
Fig. 1.



manner in which the stamps are lifted; and the loss of power can usually be traced to the friction occasioned through the stamp-rod, or lifter, not being raised in a true vertical line, or to the carelessness with which the cams are made to pick up their load, so that at one part of the rotation of the axle it is doing considerably more work than at another. It is essential to economy that the load upon the axle should be as uniform as possible, as by this means the power employed can be reduced to the minimum.

Hitherto, even in the best arranged stamps, the cams have been arranged on one side only of the lifter, so that there has necessarily been a tendency to force the tongue away from the axle, and thus cause considerable friction between the lifters and the guides: to prevent this is one of the objects of the present invention. The inventor is Mr. J. Walker, of James-street, City-road, who has had a large amount of experience in the manufacture of mining machinery; and the chief feature of improvement consists in lifting on both sides of the shank of the lifter simultaneously. By this means the true vertical position of the rod is ensured during the entire upward movement of the stamp, so that when released it is in the best possible position for a free fall. From the above diagrams it will be seen that the axle is placed much closer to the lifter than usual, and that, from the form of the cams, a given height of lift is secured, although the leverage is much reduced, hence the larger amount of work done with a given quantity of power. The nature of the improvements will be readily understood from an inspection of the engravings, Fig. 1 representing a perspective view, and Fig. 2 an end view, showing the several parts of one stamp, From this end view the mode of lifting will be readily understood. There is one lifter on each side of the shank, which raises it upright through the guides. It also shows the small square cap for the lifter to act on; the top part is square, the neck above the cap is round to admit the stamp being turned round when held up through the top guide. The bottom part of the stamp is cast with a square hole for the small foot to fit in. On the top of the large foot there is a flange cast to prevent the slimes getting away from the grates; this is important for every stamps. It also shows the end of grate frames, with the enclosure above to allow the flange to move up and down.

Fig. 2.



By this further improvement of providing a flange above the head of the stamp, the fine work is at each drop thrown back upon the grates, which are placed at an angle ready to receive it, and thus the largest quantity is passed through, and very little is subjected to unnecessary stamping, as is usually the case. Nor is this all; the stamping is done upon an improved bed, which gives four grates to each stamp, so that the quantity of work got through is very large. When the stamps are used for the stamping of gold quartz there is an additional arrangement, by which, whilst thoroughly protecting the mercury from the direct action of the stamps, it is rendered impossible for a particle of the stamped ore to escape without coming in contact with the mercury under the best conditions for securing complete amalgamation. It need scarcely be mentioned that although in the end view one lifter or arm only is shown, there are four in the circle. The stamps are altogether highly ingenious in their arrangement and thoroughly practical.

THE ARBONA QUARTZ MINE IN CALIFORNIA.

Sir,—During my inspecting tour through the mining camps of Tuolumne county, California, accompanied by a competent mining engineer and surveyor, I was requested to examine, in conjunction with that officer, the Arbona Quartz Mine, situated in the above county, and we accordingly made a careful examination of that property. The following is an extract of the report submitted by the said engineer.

The Arbona Quartz Mine is situated about six miles from Sonora, the county seat of Tuolumne county, and within half-a-mile of the village of Tuttletown; it can be easily reached in 12 hours from San Francisco, by the Central Pacific Railroad to Milton, and thence by a good mountain stage road. The Arbona vein is the main or mother quartz vein, which runs in a general north-west direction through the centre of California. Mormon Gulch, situate immediately below the mine, and also Mormon Creek, a little further down, were both very rich in the early days of placer mining in California. The title to the mine is perfect, and the owners have applied for the United States patent, which they have agreed to deliver to the purchasers of that property within a limited time. According to the information received from different reliable sources the mine owners have been residents of Sonora for the last 15 years, and bear an excellent reputation. There are no debts or encumbrances whatever upon their property.

According to the report of the engineer the Arbona is very favorably situated for being extensively and economically worked; it having been during the past three years but partially developed by means of drifts, tunnels, and shafts, the owners having expended considerable money with but slight returns, from the shiftless manner in which the mine has been worked, and the want of proper machinery. Sufficient, however, has been done to prove the whole of the vein would pay well if thoroughly worked with the improvements suggested by the engineer. The system hitherto adopted at this mine for extracting the gold from the rock has been the arrastres, and a mill has been erected for that purpose. There is machinery for crushing the ore, and four arrastres for grinding, also a blacksmiths' forge and tools. The machinery of the mill is driven by an overshot water-wheel, 30 ft. in diameter, and 3½ ft. breast. The rim of the wheel, the buckets and flanges are of iron, with wooden arms well braced with iron rods. The water is supplied by means of a flume

530 ft. in length, from a small reservoir built in Mormon Gulch. Enough water could be obtained at a small expense to run a 24-stamp mill with the same wheel all the year round. The mill, with all the machinery and flume, as it now stands, cost $10,500, and has been but little used. Besides this amount $10,000 has been expended in making roads, running drifts and tunnels, and opening the mine. The ore already worked by the very imperfect process in the arrastras has yielded $7 75c. per ton, but the sulphurets, which in this rock contain the greatest proportion of gold, cannot be worked by this method, while they can be made to yield largely under a proper mode of treatment. In order to give an idea of the quantity of gold lost with the present machinery the engineer made a conclusive experiment in my presence. Some of the sulphurets taken from the arrastras were roughly tested by being heated on a shovel to a red heat, then pulverised fine and carefully washed in a pan, and showed a prospect of 3c. to 1 lb. Some tailings or sand thrown away as worthless was treated in the same way, and showed a prospect of 1½ c. to 1 lb. of sand. The report concludes by suggesting improvements which would render the Arbona Mine a valuable and productive property for a comparatively small outlay of capital. A 24-stamp mill, with all the modern improvements, would be all the machinery needed. At the same time a tunnel should be commenced at the mill to intersect the vein near the centre of the claim, at a depth of 160 ft., from the cropping of the vein at surface.

The Arbona claim is 1200 ft. in length on the lode, with a width of 300 ft., and a square of 400 ft. attached to the mill site. The land upon which this mine stands amounts in all to 12 acres. There is a comfortable superintendent's house, stables, barn, &c. The vein at the Arbona Mine varies from 3 feet to 14 feet in thickness, and runs in a direction of north 31° west, with a dip to the north-east of 30° from the perpendicular, within well-defined slate walls. The principal or lower tunnel is 188 feet in length, and the vein has been pierced where it is well defined, 13 ft. thick, and shows free gold and sulphurets. The other tunnels show the same character of ore, with a similar amount of free gold and sulphurets.

The examination of the Arbona Mine has been made most carefully; and considering the good reputation of its owners, and the well-known ability and standing of the engineer who made the report, I consider their statements correct, and worthy of the serious consideration of the intended purchasers.

J. Berton, Vice-Consul of France,
President of the Mining Bureau.

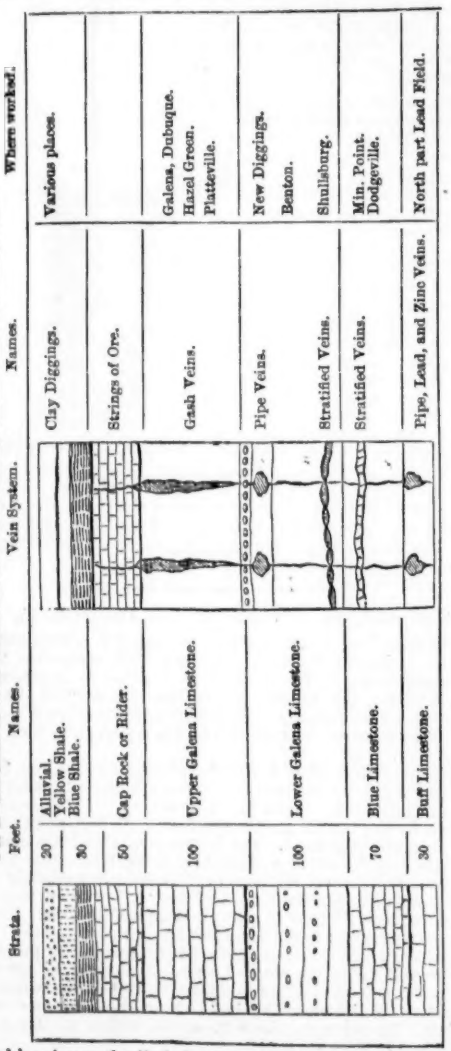
Office of the Mining Bureau of the Pacific Coast, Sacramento, Sept. 26.

GEOLOGY AND WORKING OF THE UPPER MISSISSIPPI LEAD FIELD.

By John Vancleve Phillips, Dubuque, Iowa.

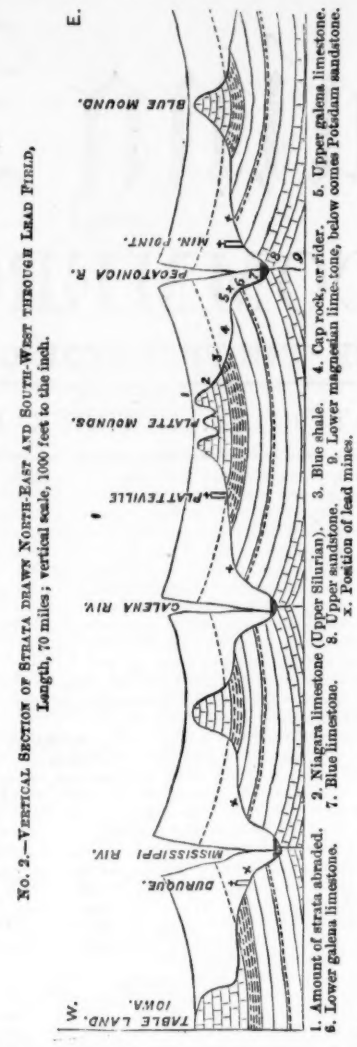
The area of what is known as the Wisconsin or Upper Mississippi lead field is 2,000,000 acres, or 3000 square miles, 200,000 acres are in the State of Iowa, 400,000 in Illinois, and 1,400,000 in Wisconsin. The centre of the field is marked by three conic elevations, known as the Platte Mounds; these are outliers of Niagara limestone, and are surrounded at a distance of from 20 to 40 miles with some 12 other mounds of the same rock and general character. The summits of these mammillary mounds are 600 feet above the Mississippi river, the general level of the lead field 300 feet. The creeks are fed by springs that flow out from the foot of these mounds, and radiate, following denuded valleys that are cut down from 50 to 250 feet in the limestones; the principal water-sheds of the lead field radiate from the Platte Mounds, and divide the field in some 10 river basins. These creeks and rivers flow over rocky beds, following serpentine valleys, and the waters are clear as crystal. The field has natural boundaries, being table-lands formed of Niagara limestone (Upper Silurian) on the west and south, and hills of St. Peter's sandstone (Lower Silurian) on the north.

The lead measures proper are 400 feet thick, and subdivided, as seen on Fig. No. 1. For general section across lead field see Fig. No. 2.



The lead-bearing rocks dip in basins; these basins are from 100 yards up to 5 miles wide, the angle of dip is from 5° to 15° with a plane of the horizon. Lead mining commenced in 1830; the ore is 75 per cent. lead, and largely associated with the carbonate and sulphuret of zinc in the lower measures. The gross value of lead made since 1830 is $60,000,000. The lead veins aggregate naturally in five families, known as gash, pipe, stratified, unstratified, and vertical veins. Each of these families of veins is confined to a particular horizon in the lead measures, and is indigenous, so to speak, to that level or plane, and dips and rises with the strata. (See Fig. No. 1.) The vein system is duplicated in each lead basin, so that a minute study of the vein system in one basin is to a large extent a key to all the others.

The lead mines are known as diggings, and are five and ten miles apart, and distributed over the whole area of the lead field. About 50,000 acres of the field has been prospected and had the surface ores mined, leaving over 1,800,000 acres of the larger and richer portion of the basins yet to mine. The lead ore mined has principally been from small dry basins, where the veins have been marked along and across the synclinal lines of axes, or along the edges and anticlinal lines of the larger basins, and ores are from the croppings or edge of the five families of veins. The north and south veins make along the edges, and between the large basins of east



and west veins. The ores crop out along the anticlinal lines of axes, and invariably grow richer along their floors towards the synclinal lines of axes. The deepest mining work done is 20 fathoms. The gash veins make in parallel fissures from 150 to 300 feet apart, and have a rider of cap rock and blue shale. The north and south veins are from ⅛ inch to 1 foot in thickness, and limited vertically to the upper galena limestone (100 feet thick).

The ores in places make in what are known locally as "sheet lots" east and west and north and south veins, from 10 to 100 feet apart, crossing each other at right angles; in other districts the ores are all in parallel gash veins, and run east and west, again all in north and south veins. In other districts in the clay in unstratified veins, and stratified veins in the rock, the ores again make in caverns, and in some districts have been followed from one floor to another in the form of rake veins. The largest single vein yet worked was known as the "Black Leg," and yielded 10,000 tons of ore, it runs north and south 900 feet, and is 20 fathoms deep, was a gash vein in upper galena limestone, mined 1830 to 1840. The Bennett vein was an east and west gash vein in matrix of clay, in fissure without cap rock, run from grass roots to 15 fms. deep, and 600 feet long, and yielded 3000 tons, worked from 1830 to 1835. The Kilbourn was an east and west gash vein, in fissure filled with clay, worked from the grass roots to 20 fms. and 800 feet linear, and yielded 5000 tons of ore, worked 1835. The Champion was a pipe vein, runs east and west under 80 feet of cap rock, was unwatered by adit 600 feet long (was 40 feet below water line of ridge or basin), it yielded 3500 tons of ore, worked 1861 to 1866, ore sold for $150 and $200 per ton (in time of war), it netted the owner 20,000*l.* a-year. A gash vein was discovered last December, 8 fms. from grass, worked to 10 fms., and has paid net 10,000*l.*, and is now paying 30*l.*, or $150, per day. In 1845 lead ore sold for $30 per ton; in 1855 at $60; in 1863 at $150 (war); present price $100, for 2000 lbs. of ore.

There are some 12 Scotch hearth blast-furnaces in this lead region. These have one and two eyes each; each smelter keeps teams, and, buys ore, and pays for it at the shaft. The royalty on dry lands, where the lead is discovered, is 1-6th, on wet lands from 1-10th to 1-12th. Zinc ore sells for $15 per ton, and is smelted at Min Point and La Salle, Illinois; the carbonates and sulphurets are both used and made into spelter, and rolled into sheets, about 50 tons a-day is smelted at the two places.

The number of miners in 1845 was 5000; in 1855, 3000; in 1865, 1500, which is the present number. The annual yield to each miner in 1852 was $437; in 1863, $1500 (war); 1871, $1000. The cause of the falling off in the number of miners has been by emigration to the gold and silver districts. The lead produced is made into shot here, and used in Chigago and Milwaukie to roll into sheets, lead pipes, &c., none goes to seaboard cities. About one-half the lead field is prairie, moderately rolling land, rich and under cultivation, the other half is white and black oak wood, more broken, and not so well settled. Improved prairie farms rate from $20 to $50 per acre. The less improved and broken lands from $10 to $20 per acre. Lands with mines on them from $50 to $200 per acre.

The Illinois Central Railroad crosses the lead field 70 miles; the Min Point Railroad 30 miles; the Platteville branch 20 miles; the Chicago, Dubuque, and Minnesota Railroad 30 miles; the Dubuque and Belleville Railroad 20 miles. Miners' wages $1·50 to $1·75 per day. Some 20 steam-engines have been used to drain wet mines; the locations selected were generally on the edges of basins, and money lost sinking between the floors of ore. The laws of circulation of water beneath the surface in the lead fields of Alston Moor, discovered by Sir Wm. Wallace, I have identified in the geology of this lead field.

The geology of the field may be subdivided as follows:—1st age. When the limestones and sandstones were being deposited on the floor of a Silurian sea.—2d age. When the rocks were being fissured in parallel east and west and north and south vertical lines.—3d age, When the river systems were being mapped out, valleys abraded, and walls of fissures eroded.—4th age. This includes the finishing of the topographical system and deposition of alluvial clays over the rocks.—5th age. This age includes the timber growth, praries, breaking out of springs, and age of repletion or filling of vein system of basins of the lead field.

The present I look upon as being the most favourable time to invest in lead mining for many years. Ore is high; in some districts the system of fissures that cross the basins are discovered and worked on the opposite sides, with wet mining lands, and centre of basin between, so that capital can be used direct to drain the lands and follow the system of veins now discovered, and the discoveries of ore in the cap rock tell where the central part of the basin should be shafted. These kinds of locations have been abandoned by the individual miner, and can be leased on low royalty, or lands purchased reasonable.

My examination of this field commenced in 1844; there are upwards of 100 basins; all the discoveries can be located geographically and stratagraphically in the basin where worked: and evidences in geology go to prove that the ore mined is but a fraction of 1 per cent. of the lead and zinc wealth of this great continental mining field.

MINES AND MINING IN COLORADO, U.S.

Sir,—Sickness and some important engagements have prevented me from writing you on the mines and mining of this country, as promised in my last letter. With regard to the silver discovery on Mount Lincoln and Mount Bross, in Park county, I have not had time to make a full survey of all the lodes (or what are termed lodes) in that district. What is now to be seen are deposits, or pockets, in the limestone formation, and although some of them are large and rich for silver, I fear the present discovery is not of as much value as reported, unless regular and well-defined lodes are discovered.

Leaving Mount Lincoln, and crossing the range into the county of Summet, about two miles, you get into the stratified and granite formation. Here there are some good and well-defined lodes, opened to the depth of 60 to 100 feet, and drifts extended on the course of the lodes, showing them to be regular and well-defined, and improving for richness in depth. From the Hecla lode I took three samples, one at the surface, one 30 ft. below, and one at the bottom of the shaft, 60 ft. deep. Those samples I consider to be an average of the lode. I have had them assayed, and the yield is as follows:—No. 1, $269 per ton of 2000 lbs.; No. 2, $426 per ton; and No. 3, $624·50 per ton for silver. This lode is in the granite formation, and is from 15 to 18 inches wide, underlying about 1 ft. in a fathom. The value of the lode in the present bottom of the shaft is at least $1200 per fathom, and the shaft can be sunk for $10 per foot. There are other lodes opened on near this one, of the most promising character, and will, no doubt, open up when developed very rich for silver. I have no doubt this district will be found equal to any yet discovered in the Rocky Mountains, as there is every advantage for the working by drifts to any depth. In fact, all that is wanted is capital to open up the mines, and erecting the works for smelting the ore; and if English capitalists were to turn their attention to this district before it is much opened up, instead of purchasing mines elsewhere, and paying large sums for them, they would do well, as good property can be had here on the most reasonable terms, it being owned by working men, who have no capital. The Hecla Mine is owned by four Cornishmen, who will dispose of it on the most reasonable terms; and I hope to see in the coming spring some English capitalists in possession of it, and developing it as it so richly deserves.

Returning to this place, I find mining to be moving onward. The Messrs. Briggs Brothers have commenced to drain their mine on the Gregory lode, and have about 300 feet out of 500 feet already drained. This mine will drain the Smith and Parmille, Black Hawk, Consolidated Gregory, and the Naragansett, which are all on the same lode, and will give employment to a great number of men, and with good management will leave large profits. The Bobtail Tunnel is also being pushed onward as fast as possible, and is expected to reach the lode in December, and will unwater the mine nearly to the bottom, when large quantities of ground will be laid open, and enable the different companies on this lode to sink on to deeper levels, and return all their ore through the tunnel to the mills, which will be a great saving in the cost of carriage. This is a step in the right direction, and it would be well if other companies were to adopt the same principle. Other mines are making good progress in working, the particulars of which I will give you in my next communication.

I am sorry to inform you that we have in this city one of the worst cases of swindling that has ever come under my notice in this country, and I have seen a few during the time I have been here. About twelve months since a party of this place became successors to the Messrs. Chaffer in the banking business, agreeing to pay 10 per cent. on all deposits, and large sums were deposited, in the full belief that Nathaniel Young and Co. were a good firm. A few days since the bank burst up, and the Co. cannot be found. There is no doubt that Mr. Young has been made a scapegoat of by his partners. Who the partners were is not correctly known, but they are supposed to be some parties who are considered the principal men of the city. Let them be who they may, they have been much too smart for John Bull and Cousin Jack, as I am informed that they are the only losers; and, from what I can gather from the most reliable sources, the loss will be over $60,000; and from what I can learn this loss will all fall on the working men. Luckily for your correspondent, he has not lost much. From what I can ascertain, those who could afford to lose a few dollars, and were friends of the firm, drew out their principal and interest only a few days before the bank broke. This makes the case more black, dishonest, and vexatious to those who are the losers, as it is not probable they will get a cent. of interest or principal returned, while the swindlers are laughing at the smart trick they have played.

I enclose you by this post the new Mining Law of the United States, in full, which will come into operation on May 10 next. All mining claims that are not working on that day, and have not been wrought for the past year, will be at liberty to be taken up by other persons, and worked by them. This, I think, is a good law, as it will, no doubt, put a great many good mines to work that are now lying idle. As to myself, I shall be very cautious about taking possession of property on that day, as no doubt violence will be offered to persons who then attempt to gain possession. H. B. Grose.

Central City, Sept. 23.

MINING ENTERPRISE IN NORWAY.

Sir,—The prosperous position of the metal trades in England has caused attention to be directed to the development of properties elsewhere, which during the period of depression were lying in abeyance; and amongst the foreign properties recently brought into the market is a very valuable series of mines in the North of Norway, with reference to which the subjoined particulars will be interesting:—

In the geological work "Gaea Norvegica," the late Mr. Keilhau, a celebrated Professor of Mineralogy at the University of Christiania, speaks in the following words about the iron deposits in Ranen Nordland, Northern Norway. "By the Langvand Lake, in Ranen, there is a considerable deposit of iron ore; it is a stratum of 3 to 4 fathoms extent, consisting of shivering (leafy) and granulous iron glance, which is especially mixed with quartz. It's extent is very considerable—nay, it is pretended that it continues for several Norwegian miles.* The rock in which it is situated consists of micacious schistus, stink-marble, gneiss, and slaty-quartz; these formations, together with the stratum of ore, are lying by piles on the top of each other, with a fall of 30° to 40° north-east. The iron glance can, at least in some of the poorer layers, be regarded as representing the true mica in the micacious schist. Strøm (a Norwegian mineralogist) admits that it is the same deposit of ore which reaches from Ormli to the Fuglevik Mountain. The possibility hereof cannot be denied, although the ore that appears at the last-named place is not iron glance, but magnetic ironstone." In this district there are many important mines which would well repay energetic development.

The *Hóisokness Iron Mine* is situated on the Ormli grounds, in the parish of Mo Ranen, Nordland, in Northern Norway, about 4500 yards from the sea. The lode is about 2 yards broad, and begins at the Langvand Lake, and continues in a north-westerly direction into the Ormli Mountain, about 50 yards above the level of the sea. The ore can be brought from the mine across the Langvand Lake, distance 1500 yards, to the Lenningen Ferry, from where there is a good, rather declining, road to the Aasness harbour, distance about 3000 yards, where the largest steamers can anchor close up under land.

The *Fuglevik Iron Mines* are situated in the mountain called the Fuglevika Fjeld, in the parish of Mo Ranen, Nordland, in Northern Norway, about 6800 yards from the sea. It consists of six mines, where the lode can be seen about 2½ yards broad nearly all through from the first mine right through to the last one. In fact, iron can be walked on for miles. The ore can be sent down on a timber sleep from the mine to the Langvand lake, distance 800 yards, and from there in flat-bottomed lighters with a small steam-boat to tug across the Langvand lake to the Lenningen ferry, distance about 3000 yards, and from there on the same road, as named in the Hóisokness Mine, No. 1, to the Aasness harbour.

The *Björenaag Iron Mine* is in a rock situated on a ground called the Björenaag, in the parish of Mo Ranen, Nordland, in Northern Norway, about 12,000 yards from the sea. The ore can be seen in large masses, and begins at the Rövandsaag river, and continues in a western direction. The ore can be brought down in flat-bottomed boats on the River Rövandsaag to the Langvand lake, distance about 3000 yards, and from there across the same lake to the Lenningen ferry, dis-

*1 Norwegian mile=7 English miles.

tance about 6000 yards, and then forthwith on the same road as named in the two former mines—Nos. 1 and 2—to the Aasness harbour.

The *Kobberdambæk Iron Mine* is situated in a rock called the Bymarken, at the foot of a small river called the Kobberdambæk, and about 3000 yards from the sea and town of Drontheim. The ore can be seen in masses of very promising description. There is a good, rather steep, road from the mine to the sea, where the Undals Pyrites Company are now going to erect a large pier, the use of which can be had at a very small rent. At the harbour of Drontheim, which is open all the year round, the largest steamers can anchor close up under land. There is also good opportunity to have the ore from this mine sent to England by the steamers that are running from this port all the year round.

The *Ostmarkens Iron Mine* is situated in a rock on the Ostmarkens ground, and 6 yards from the sea, 3000 yards by land and 1500 yards by water from the town of Drontheim. The ore can be seen at several places, but a few shoots must be made before a regular lode can be had. A pier can be made close to the mine, and the ore could then be brought right on board the steamers.

The *Haabets Silver-Lead Mine* is situated at Mo Ranen, Nordland, in Northern Norway, about 650 yards from the Mo harbour; it has been worked on trial for seven months, and at present there are five men working in the mine. This lode is running in a westerly direction, and shows now 18 in. broad; it contains silver, lead, and a little copper. A few barrels is said to have been sent some time ago to the Kongsberg Silver Mine, belonging to the Government, for inspection, and it was paid with 33*l*. 6*s*. 8*d*. per barrel. At the other side of the mine there has lately been found a very promising copper lode. This mine belongs to a few of the farmers of the place, but the sale is transferred to me.

The *Grandheien Copper Mine* is situated on the Grandheien grounds, in the parish of Mo Ranen, Nordland, in Northern Norway, and about 13,500 yards from the Mo harbour. The lode shows 3 in. broad, but is inclined to increase further in. The ore can be carried on carts down to the River Ranen, distance about 4500 yards, from where it can be sent down in large lighters on the same river and right alongside of the steamer's side at Mo harbour, distance about 9000 yards. There is good opportunity to have a tramway or small-scaled railway from the mine to the river, and the same would not be very expensive, as there is plenty of wood to be had at low prices.

The *Mo Silver-Lead Mine* has just been taken up close to the Haabets Silver-Lead Mine, and will, with a small outlay (say 30*l*.), give the same prospect. The ore can be seen on several places, and contains silver, lead, and a little copper.

The *Ostmarkens Quartz (Marble) Quarry* is situated at the same place as the Ostmarken Iron Mine, No. 5, and about 50 yards from the sea. Any quantity of quartz and blocks of any size can be obtained, and sent down on a declining timber sleep to the wharf, where the largest steamers can anchor. The cost of working this quarry would be very small, as the quartz is in a large isolated rock containing only quartz, where a few shoots would bring many tons of blocks out. As the quarry is lying so near the town of Drontheim there is good opportunity to have the blocks sent to England by the steamers running direct from this port all the year round, and at a low freight.

The *Bosmon Pyrites Mines* are situated on the Bosmon Stenness, Lópberg, and Almliens grounds, in the parish of Mo Ranen, Nordland, in Northern Norway, and about 600 yards from the Aasness harbour. It consists of ten mines (all connected), where the lode can be seen 1 fathom broad and 6 fathoms long on surface. Any quantity of this ore can be obtained at a very small cost, and sent down on a timber sleep right into the ship's hold at the Aasness wharf. If you take and crush a little of the ore from this mine, and strew it on the top of a lighted match, there will be a very strong smell of sulphur.

During the winter the lake and the rivers are belayed with ice, but the ore can then be brought over on sledges, which will be found cheaper. It would take 3½ days by steamers to bring the ore to England, but it would be a very wise plan to put up a smelting furnace and iron foundry at the place, as there are large woods to be had at a very low price round about the mines, from which charcoal could be made; the steamers could also, as a return freight, bring coke to the Aasness landing place. There are also several waters about the place—especially can be named the large waterfall at Shaansæng in the Ranen river, where there is an excellent opportunity to have arranged a hammer for the making of bar-iron, &c.; this is a very cheap and common method in Norway and Sweden, using the power of the waters instead of steam. Workmen are usually paid in summer time from 1*s*. 9*d*. to 2*s*. 8*d*. a day, and during the winter from 1*s*. 4*d*. to 2*s*. 3*d*. a day. There is a good opportunity to have arranged a tramway or small-scaled railway from all the mines to the Aasness or Mo harbour if it should be preferred to bring the ore over to England. There is also another plan for bringing the ore down from the mines by having the ore in large lighters with a small steamer to tug them across the Langvand lake to the Lenningen ferry, from where it could either be carried in cars or having a railway constructed to the Aasness harbour. The largest steamers can run right up to Aasness and Mo harbours, which harbours are open all the year round.

Throndhjem, Oct. 7. CARL JOHNSON.

[Map of the locality, and samples from the several mines, will be forwarded to the *Mining Journal* Office.]

PNEUMATIC AND SPRING STAMPS.

SIR,—On looking through the Journal last Saturday I came across something respecting pneumatic stamps, as they are called now. Well, it is just about 40 years ago when I saw for the first time what was then called atmospheric stamps and hammers at work, and do not think at that time one man in a hundred could even spell that elegant word, let alone understand it. I hope it is not so now. At that time John Haig had just taken out his patent for working all kinds of machinery by atmospheric pressure, and about the most successful patent ever I remember, which is more than everybody can say; but certainly it was the most elegant way of communicating power at a distance, no shafts or straps being required; and just then the sugar refiners were at the height of their prosperity, and getting rich, so that these small air-engines were introduced into every house, and brought so much work that for years it was extremely profitable; not that it added any power, rather the reverse, but it got rid of all straps, shafts, and everything that encumbered the house, and in their stead simply a small tube to the pump of the engine, which kept all the small air-engines doing all the work of the sugar refiners for many years.

I remember that many people thought these air-engines worked of themselves, not seeing the steam-engine, but of course people know better now; but, at the same time, it gives just what we got then, a perpendicular lift, so that the hammer fell properly on the material to be drawn. Well, that is an object worth gaining, and will very likely pay for the more expensive fittings, as against the rubbing up of the old plan it is just like lifting a man by the chin to throw him on his back. There is something said about spring stamps. Now, everybody knows that there is nothing to be got out of a spring; except motion is given to it you can get nothing out. Air and spring are both alike as far as they are concerned.

Oct. 15. ENGINEER OF FORTY YEARS.

VENTILATION—SHIPS AND MINES.

SIR,—I have just read, with sorrow, in the "British Quarterly Review" that the last ton of coal is likely to be dug out by the year 1945, at the rate of consumption present and prospective. Now, the enemies of Great Britain have long prophesied her downfall, and a greater calamity could scarcely be imagined.

It is maintained that coal cannot be mined at a greater depth than 2700 feet, owing to the fact that at that depth the heat stands at 92° Fahr. It appears that the water can be easily pumped out, and the coal easily raised, but the deeper they go the greater the heat, and the miner cannot bear a greater heat than that. I am aware that various plans for ventilation are in use in mines; however, I have one to suggest. I have been employed at sea most of my time, and sailed in many a crowded emigrant ship, and I assure you that the principal and best ventilation, notwithstanding all the new ideas, is to build a ship on the old-fashioned plan of having a fore main and after hatchway. Now, the fore hatchway is before the fore mast, the main between the fore and main masts, the aft hatchway after the main mast. Now, Sir, the draught between these three hatchways is truly surprising, provided, of course, that the passenger deck is not partitioned off.

Now, Sir, I once left London with ten steerage passengers for Australia, in a barque of 374 tons. A small space was partitioned off for them under the after hatchway, though allowing them ample space. Under the line the hatchway was always open, yet the heat was sweltering. In the same vessel I took 140 steerage passengers from Sydney to San Francisco. Of course, all the hatchways were continually open, as we had to pass under the warm latitudes. As, however, the passenger deck was not partitioned off there was free communication between the different hatchways, and the draft between them was remarkable. The passengers, from the circumstance of all the hatchways being open, and the draft between them, suffered far less from heat than the first-mentioned ten passengers, the latter having only one hatchway open, while the 140 had three hatchways open, hence they had the benefit of a shaft, and were much more comfortable.

Now, does it not seem sensible that the shaft of a mine should represent the main hatchway, and that shafts should be sunk one on each side of it, as far off as the works will allow; the two last hatchways to represent the fore and aft hatchway; of course, all three shafts to be in a line? Now, would there not be a draft between these three shafts, or hatchways? The only difference I can see is that the passenger deck is immediately under the spar deck, and the miners' deck may be under the spar deck, or surface, some hundreds of feet. However, I think that would not stop the draft. There is much about a draft which a philosopher cannot explain. I have been told by Californian miners that if you make a wooden tube, or pipe—say 6 in. by 12 in., no matter how long—and make a partition down the centre of the tube, the draft will go down one side and up the other, the tube, owing to its being partitioned, carries a draft both ways, and thus is made to ventilate a tunnel.

Now, Mr. Editor, should these suggestions be deemed worthy of your valuable Journal, their insertion will much oblige an— ENGLISHMAN.

San Francisco, Sept. 17.

P.S.—I have repeatedly noticed that when only two or three hatchways were open there was scarcely any draft. Three seemed absolutely necessary.

PRONUNCIATION.

SIR,—Many persons complain of the English language, because, amongst other things, the words are not pronounced according to their orthography. The same may be said of the names of *places*. A few days ago a young gentleman from Richmond came to see me at St. Just, near Penzance. I directed him in my letter to come to Boscaswell Downs Mine. He first went to St. Just village, and was told to go northward. On the road he met a woman, of whom he enquired if he was in the right way to Boscaswell Downs Mine. She said, "There is no such mine in the parish. I know all the mines. There are Botallack, Spearne, Spearne Moor, Levant, North Levant, and Scale Downs in this neighbourhood." My friend said "I will try Scale Downs, and, following the woman's directions thither, he found that *Scale Downs* was the Boscaswell Downs Mine.

The divergence of the common pronunciation from the spelling is the occasion of some trouble to strangers. I do not know of any instance more striking than that of Auchinleck (the residence of Boswell, Dr. Johnson's biographer), which is pronounced "Affleck."—*St. Just, October* 10. SOJOURNER.

GREAT LAXEY MINE, AND ITS MANAGEMENT.

SIR,—During this serious misunderstanding between the proprietors and men, which has been watched with great interest by the mining world, one portion of the arrangements would appear to require consideration—the unusually small number of agents engaged in carrying out the important operations of this great and prosperous enterprise. Any mine in Cornwall or Devon working to anything like the extent of Great Laxey would have at least double the number of agents to be in attendance to see the men down and up at every hour (day and night) appointed for relieving each other; to pay constant visits underground to superintend the men in their different places of work; to set the bargains throughout the mine; to measure the ground broken, and fix prices for the forthcoming take; to overlook the machinery and water-courses; to attend the samplings and weighings, and other manifold duties, which none but a practical man can particularise.

No mine can be conducted with any degree of satisfaction either to men or employers without a sufficient and well-appointed staff of agents underground and at surface. OBSERVER.

Oct. 15.

LEAD MINING IN NORTH WALES.

SIR,—Mining in Wales, even amongst people so fond of the antiquity of their nationalities, still seems to be the favourite theme of "Tradition whispering to History." Never, perhaps, were these words more properly applicable that at the present, when the workings of the "old men" are being ransacked in every direction; these acute miners have been generally found pioneers of recent so-called "great discoveries," when the fact is they should have been deemed only great developments; nor are the works of the "old men" now the only guides, the spots re-wrought by those whose memories and persevering efforts still live in the localities once so greatly benefited by their endeavours, are being again, and now are, the scenes of busy industries.

The decline of many of the former rich mining districts must be ascribed to other reasons than the absence of minerals, no doubt the principal causes have been the absence of those determined and indomitable spirits whose efforts neither high dues, low prices, or the vicissitudes of fortune could deter or vanquish; to these succeeded others with less confidence, whom the depression in the lead trade appalled, consequently they neglected the pursuits of their forefathers. More energetic parties still wrought on notwithstanding, and theirs have been the rewards. Again, the modern mode of transit was unknown, the now obsolete conveyances were costly and tedious, machinery and appliances were of the most primitive and rudest description, so that it is not to be wondered at that lead mining in Wales should fall into decadence.

Under the present improved *regime* in mining affairs of the Principality—to wit, reduced dues, improved appliances for manipulating as well as raising and transmitting produce, no wonder scientific and persevering efforts have been and are crowned with success, and that capital is being attracted for the purposes (at once legitimate and praiseworthy) of rendering the valuable deposits of mineral again remunerative to the miner and conducive to the national weal.

To quote recent successes would be a work of mere supererogation; to enumerate the past it is only necessary to refer to comparatively recent history, especially in the county of Flint alone, where the profits on certain mines have been counted by hundreds of thousands. We need but mention Talargoch, Trelogan, Holway, Milwr, Hereward, Halkyn, Pant-y-Go, Rhosesmor, Great Hendre, Mold, Fron Fawnog, Old Westminster, Minera, Pant-y-Mwyn, South Mold, &c. Besides these, in the same county, are numerous places showing the works of miners, of whom no records save these remains and traditions are left.

It would be easy to quote parallel instances in neighbouring counties, as Cardiganshire and Denbeighshire, where the Minera, and in Merionethshire, where the Van and other mines are giving substantial and lasting proofs of the immense value of the Welsh mining industries. Under similar conditions works on an extensive spirited scale are about to be carried out in thee first-named county at the Llyny Pandy Mine, which is known to be in one of the most highly mineralised pieces of ground even in that favoured locality, being surrounded by the before-quoted mines; the geological conditions (junction of the limestone and sandstones) are precisely the same as in these celebrated mines.

The project we mention embraces the further development of lodes already proved productive by the "OLD old men," as well as by the more modern "old men," which were abandoned for the reasons before mentioned, as well as to try new ground by cross-cutting, in which are known lodes to the number of three or four within a few score fathoms. If science and natural indications go for anything the value of this sett cannot be doubted, and it is questionable if any property in Wales ever offered greater *prima facie* evidences of success. G. H.

MINING IN WALES—NANT-Y-RICKET MINE.

SIR,—In his observations on mining in Wales, which appeared in the Supplement to last week's *Mining Journal*, "Another Tourist" has made a somewhat important mistake, where he states that some of the copper at Nant-y-Ricket—he understood—assayed as high as 34 per cent. It should have been some specimens of copper from Nant-y-Ricket assayed as high as 40 and 43 per cent. As regards the average percentage, when properly prepared for market, he is correct, 20 per cent.; and very unfortunately for myself, all his other remarks respecting Nant-y-Ricket, are only too strictly true.—*Severn House, Severn Mine, Oct.* 16. DAVID PRICE.

THE TAMAR METAL EXTRACTION COMPANY.

SIR,—In last week's Journal we are told that "a company is in course of formation, with a capital of 12,000*l*., to acquire the lease of the Lower Tamar Smelting-Works, and the exclusive right of working the mineralised surface deposits, estimated to contain over 250,000*l*. worth of silver alone, besides other metals, and that the prospectus will be found in the Journal." I have carefully "costeaned" the *Mining Journal* of last week, but have failed to discover the prospectus. However, as I happen to know the *locus in quo* of the Tamar Smelting-Works, it does not signify. Ah! how often, when a school-boy in an ancient borough on the banks of the placid, beautiful Tamar, have I watched the smoke streaming away from the tall chimney of the smelting-works, and the old familiar windmill, too, in full swing on the romantic summit of the neighbouring historically celebrated Kitt Hill. *Sed tempora mutantur;* the windmill has long ago been supplanted by a gigantic steam-engine, and the smoke from the smelting house stack has ceased to obscure the landscape. But a truce to sentimentalism, and some broker cries "question!" I have not only visited the Tamar Smelting Works, but recollect, lang syne, when the eminent assayer, Percival Johnson, of Hatton-garden, had the direction of the works. What resident on the banks of the Tamar can have forgotten Mrs. Johnson's well-appointed turn-out—her high-mettled greys? Sir, the object of the undersigned is to point a moral, and not to inflate a bubble. Intending investors! It would have been thought that Mr. Johnson was too profound a practitioner to leave any argentiferous slag at the Tamar Smelting Works that would pay for treating; and as for the silver to be eliminated from the debris of the lead lodes in the neighbourhood, many will be astonished to learn that it will pay the cost of extraction.—*Swymbridge, Oct.* 16. GEORGE CHOWEN.

NEW WHEAL LOVELL.

SIR,—From communications which I have received, there seems a general impression amongst our shareholders at a distance that I am the same person as Capt. Joseph Prisk, late of South Frances. Now, I take this opportunity of stating that this impression is altogether erroneous, and that I am another Joseph Prisk, and in no way related to or connected with the Capt. Joseph Prisk above referred to.

Laity Cottage, Helston, Oct. 16. JOSEPH PRISK.

NEW LOVELL MINING COMPANY.

SIR,—Allow me, as one present at the New Lovell meeting, at which a purser was appointed, to correct a few misconceptions of your correspondent who styles himself "A Shareholder," and to give my reasons why I cannot concur with him either in his direct censure of the Chairman, or in his implied recommendation of Mr. Field.

The Chairman did not, as alleged, unfairly reject a proxy on account of a small error between 105 and 100 (the number of shares purporting to have been held by the giver of the proxy), but because, I believe, this error appeared to him, as it did to others who knew the cause thereof, as strong presumptive evidence that an insertion had been made in the proxy after it had been executed—an act that I do not regard as censurable in this instance, but as one that clearly rendered it inadmissible. But had it been admitted, the holder would have still been in the minority, and the result would have been precisely the same. The Chairman, however, with equal impartiality, peremptorily rejected two other proxies that would have counted for "his nominee," on the ground of no greater informality. I am, therefore, of opinion that this imputation of favouritism is unjustified.

The majority of the shareholders are not "legally in favour of Mr. Field," as further alleged, as I have above explained. Moreover, his supporters in person and by proxy did not exceed 15 or 16 in number—a small proportion of nearly 150 shareholders. It is a fact, I believe not generally known, that Mr. Field and his most active supporters are defendants in a pending Chancery suit in which another candidate for the office happens to be the plaintiff. But the shareholders, of course, are not interested in this *singular coincidence*. They are, however, interested in the choice of their financial officer; and since Mr. Field made very considerable omissions and errors, both in principle and detail, when he was employed to investigate New Lovell affairs in 1869, such as no auditor undertaking an office of high trust and responsibility should have made, I contend that there is no ground for his strong recommendation to the shareholders. FIAT JUSTITIA.

PROVIDENCE MINES.

SIR,—Seeing a paragraph in your Mining Notabilia that these mines were reported to be getting very poor, and that extra efforts were made to raise the needful for the last dividend, I wrote to the pursers, and annex their reply, which I shall feel obliged by your publishing with this letter. The agents I find reported to the last meeting that the mines were looking well, and improving. THOS. STEVENSON,

Nottingham, Oct. 14. A Shareholder.

SIR,—We recommend you to attend to the official reports of the Providence Mines, and not to the reports of trickery jobbers. SAMUEL HIGGS AND SONS.

Penzance, Oct. 4.

P.S.—Yours is the second remark we have heard of the affair.—S. H.

WHEAL VINCENT (ALTERNUN).

SIR,—Permit me, through your valuable Journal, to ask a question on Promise and Production, in regard to a young mine lately started at Alternun, Cornwall. As a general rule, we find that the estimates made by "practical" mine managers and agents are 75 to 100 per cent. above realisation, and that those who invest in those undertakings, on the faith of those estimates, are in nine cases out of ten misled, which does not reflect much credit on the "practical" men whose reports have been circulated about the country, to, in reality, the discredit of themselves. But in the case of the Wheal Vincent, Alternun, started and managed up to a certain time by a company remarkable for soberness and matter of fact business habits as a mining company, I would ask the question—Where is the extraordinary and unequalled batch (as a first batch, and in such a short time after starting) of 9 or 10 tons of tin that was to have been ready for market by the 9th of this month?

Stokeclimsland, Oct. 10. J. S.

THE APPROACHING PANIC, OR THE TRADE OF ENGLAND—ITS PRESENT AND FUTURE.—No. I.

SIR,—I venture to give my opinions respecting the present and future state of trade generally. After a storm comes a calm; such is the old and prophetic saying, and upon the same true, though perhaps rather more vague, rule allow me to add a suggestion or statement of my own, that after a calm, sooner or later, comes a storm. England has for some time past, in the shape of business, been in the enjoyment of continued calm weather, all apparently a joyous sunshine, not even the rippling of a wave to disturb the serenity or supposed safety of the trade of the land, but as after a dreadful storm comes a dead calm, so has Nature and past experience taught us, or endeavoured to teach us, to expect a perfect hurricane after long and continued calms. I am quite convinced that there are a few out of the many who will feel disinclined to give credence to my ideas, but it is my intention to convert such, if possible, and endeavour to give a real exposition of the present state of affairs, and depend upon it that such a financial storm is about to burst through the land that will, if proper precautions are not taken, cause such a convulsion, stagnation of trade, and utter wreck of ruin, poverty, and distress to be scattered broadcast, that will bring about riots and bloodshed, and possibly carry out one of the few remaining predictions made a century since, not yet fulfilled—that the streets of London shall flow with human blood. The incredulous may say impossible, but I venture to remark that it is more than possible; it is probable. No one before the last continental war could have believed that thousands of human beings would in a few weeks have been slaughtered, with Paris in a state of siege, and all the frightful subsequent ravages of the Commune, &c.

Let only a money panic pass through the land this coming winter, and I believe it will, and the artificial trade that is now going forward must suddenly cease, there will be tens of thousands of families thrown out of bread, and the consequences of riots must ensue. We are told that the nation is getting wiser and weaker; it certainly appears so by the resolutions of working men to toil only 9 hours instead of 12 to 18 per day of 24 hours, asking extra pay upon the strength of less work; this, at least, shows apparent wisdom, and if it be true that every generation is getting weaker as regards manual strength, it is well that the hitherto willing slave has at last acquired sense enough to husband of his own accord the powers of existence that, through some physical laws of Nature, are failing him. However, I have no faith in Trades' Unions, to give the man power over the employer; the question of capital and labour is simply a matter of supply and demand; with a superabundance of capital (either imaginary or real, as the former has the same effect until the spell is broken) the power is in the hands of labour when trade is brisk, and the demand for labour now going forward; and when the demand is great and the supply small, working men want no Unions to espouse their cause. The power as regards enacting terms must more or less be in the hands of the supplying party, every whit as much respecting labour as any article of commodity. Again, if capital be short, it of necessity acquires the power to dictate to any person or any article wishing to be availed of its services.

Artificial trade I have said. Yes; the prosperity of the land has gone to such a pitch that it requires but a few calm reflective moments upon the subject to convince the unobservant that it must be artificial. Coals and iron, and all other materials of dire need, constituting the trade of the country, have risen to such a price that it is a moral impossibility for the consumer to be a consumer much longer at the present tariffs; and as the tide when it flows continues to flow, and no earthly power can check its course, and the ebb of a necessity and naturally in due season takes its place, so it is with the English public, which has been going recklessly along with the flood that has reached to an almost unknown height, the ebb must set in, and leave thousands wrecked, high and dry, spreading misery and desolation all around. That there is now a great demand for coals, iron, and other such like articles of commodity no one can dispute; that it cannot last much longer under present circumstances who can doubt? And when by the depression of trade, which must come, prices are brought down to even much less than they originally were, who will dispute the inevitable failures of the consumers at present prices?

What is it makes trade or its depression? Nothing but confidence or the lack of it; and it is confidence that supports the present enormous amount of artificial cash business that is going forward, but unless great precautions are at once and without further delay made, it will be found to have been sadly misplaced. Gigantic and successful trade cannot be carried on permanently without wealth, and I maintain that we have no wealth to support trade on so large a scale. By-the-bye, and without going any further, what is wealth? Nothing more nor less, when robbed of all its artificialities, than bullion—gold and silver: not even notes are allowed to pass into the scale when the day of reckoning comes; no promises to pay were taken into consideration in the panic of 1866. Gold and silver were then the requisitions, and one million sterling in those days of pressure in hard cash were fifty times the value of Bank notes.

Look at the existing system of banking; it is ready to burst with plentitude, fostered by the success of the trade of the country, and representing a land fairly flowing with milk and honey; but there is no foundation. The shadow is taken for the substance; hence the reason that 2,000,000*l*. or 3,000,000*l*. in the clearing-house are treated as so much dirt. Dross, filthy lucre, are the terms applied to money, and well may a few millions be passed over in a day with contempt when the amount is personated by bits of paper—cheques. Will my readers in following me calmly reflect over the French loan? 150,000,000*l*. was the sum asked for in about 48 hours, because confidence was paramount, at its zenith, and chiefly through reason of the general anticipation that shares would soon go to a premium, and profits thereby be attained, twelve times the supply, or 1800,000,000*l*., was ready to meet the demand; this amount means in gold, at 4*l*. per ounce, 12,555 tons, or silver, at 5*s*. per ounce, 200,892 tons. The idea of 200,000 tons of silver! It would pave every street in London. This is no idle fable, no mere chimera of the brain. What I now allude to happened in real life and facts only a few weeks since; to realise its full effect, dwell upon the matter a few moments. Gold and silver by the hundreds and thousands of tons, all ready for investment, which simply means, or should mean upon a true analysis, 1800,000,000*l*. in money, looking for a job, idly employed upon casual work, with even more casual wages or interest, but the privilege therewith of "bettering" itself without notice upon a good offer being presented. How absurd it is; here we have much cry and little wool with a vengeance. The world may well be called a stage, and all the people actors; and I might add that a melodramatic farce is now being performed with such a *dénouement* hardly dreamed of, let alone rehearsed, in store for the players. The wealth of the land, or at least nine tenths of the money in circulation, or rather supposed to be, exists only in the imagination of the public, and with all the vaunted boast of England's wealth, a small army of London capitalists could, if they so wished, by combination or determination, by playing their cards to suit the game, get hold of the bulk of gold and silver, and so distort the features of every bank, and leave the whole, one and all, gasping for breath, and on their beam ends in less than a week, and thus show the real value of gold and silver, but such a monopoly can hardly be expected to take place, as, unlike some articles that are held by a few of the wealthy monopolists, at least a small army of capitalists would have to be formed for so great a spec, and fortunately it would not be easy of organisation or control. Again, who is going (and especially amongst the really rich) to be bothered with filthy lucre? the handling of the very coin itself.

How accommodating it is to receive and draw cheques in preference to the sending of bank notes, or running about the country receiving and paying hard cash. The banking system is, indeed, a privilege: it is one of the most luxurious, assistant business boons that civilisation enjoys, and to make it perfect all that is required is that hard cash, or something reasonably near the mark, should be forthcoming when wanted; that this is not the case in times of panic has been proved in the past. It may be argued that if you have a cheque for 100*l*. or 1000*l*. upon any bank by a good customer, you have only to present it in the usual way to receive cash; granted, I admit this, but there is a limit to everything. A man with only 5*l*. cannot find 50*l*., and neither can a bank with 5,000,000*l*. honour the cheques of its customers in hard cash for 50,000,000*l*. In the case of panic, and everyone wanting cash, it requires but a run on any bank, and in a few hours its fate must be sealed, with the last come badly served; and where business is carried on in the world to the extent of hundreds of times the real existence of cash, there must of necessity, when the day of reckoning or panic arrives, be many deficiences. It is, therefore, quite clear that the finding of a gold or silver mountain would do more good than harm, but as such is not likely to happen, every exertion should be used, every nerve strained, to discover as much of the precious metals as possible, and in times of dire need only a few millions extra in hard cash are capable of restoring confidence. In 1866 an extra demand of a few millions in cash, when the panic was at its highest, would have doubled up every bank in the kingdom, the Bank of England included, and in such seasons people trouble themselves not with what they are going to do with their money, the only aim being to grasp the capital. England is indisputably wealthy: its lands, crops, buildings, precious stones, jewellery, articles of vertu, and innumerable stores, &c., represent incalculable figures; but although when confidence is unshaken they mean wealth, still they are not money, and in a panic, and with a yearning demand for cash, the most precious diamond and all other articles denoting assets, property, save and except the most pressing necessities of life, would be almost without value.

I wish not to be misunderstood. It would be utter folly for a man worth 10,000*l*. to have his talents or capital hidden under a bushel basket lying idle; that would be

only making matters worse, as independent of the profit that must accrue in the shape of interest when employed to advantage who would struggle to become rich if the result ended in the accumulated wealth of 10,000*l.*, or 1 ton 2 cwts. of bullion having to be worn round the neck of the happy or unhappy possessor. Riches even of the greatest magnitude can certainly give nothing but ease, comfort, independence, and luxury, and satisfy ambition, with the privilege of being enabled to do good to others who have less of this world's smiles than frowns. It is, with a few exceptions, but for little more than these enumerations, that we all strive hard in making haste to be rich. We do not, as a rule, want money for money's sake, and most certainly should have no desire to be saddled with its continuous weight in reality upon our backs—in fact, and in a word, we want money to enjoy this world's enjoyments, and above all, when we once have become possessed of it, have no taste for suddenly finding our supposed substance to be but a shadow. This will be the case with many most assuredly, as no other result can ensue in a panic when a man puts himself down, and is put down by his bankers, for 5000*l.*, and his effects or the cash that can be allotted for his portion is but a tithe of the amount. Nay, this is not mere talk; it is real truth. Take any or every bank in England. So great and powerful a thing is confidence that the possessors of wealth rest in calm tranquility in the happy thought that they have only to sign their name upon a bit of stamped paper to draw out their own, but how can 5*l.* pay 50*l.*? How can 50*l.* pay 500*l.*? or more still, how can 50,000,000*l.* pay 500,000,000*l.*? Every bank in England knows as well as I do that if it can in reality accomplish the absurb boast of being able to pay its notes in cash, that four-fifths of the customers would only have to ask for their own to get it not. Again, I say the money does not exist; it wants but a simple calculation to ascertain the enormous amount of business that is daily being done, and it is easy to discover that the supposed wealth of the land as regards cash is all imaginary. I do not attempt to dispute the fact that bankers give their customers who entrust them with monies their own after a fashion, but bankrupts have once been solvent. I should like to know what security a banker gives, or can give, for the return of the deposits of one and all when asked for.

Let us go into particulars, and analyse the whole subject. We will take for an instance that A, of Plymouth, buys goods of B, in London, to the extent of 1000*l.* Now, this is only one of the millions of transactions occurring daily throughout the kingdom. A sends cheque to B; thus A is poorer in cash 1000*l.*, and B richer if the cheque is good. What does that mean? The signification is really nothing more nor less than this—A happened to have 1000*l.* in figures with a Plymouth banker, and the figures are simply transferred. Thus A satisfies B, and A can no longer draw for that 1000*l.* or those particular figures. Then comes the adjustment of the account; B has placed the amount with his London bankers, the Plymouth banker debits the London banker, the London banker credits the Plymouth banker, and thus with confidence the little matter is amicably arranged to the satisfaction of all parties; and a sweet, pretty, easy little mode of doing business it is while it lasts, but after all it is only a more clever, clean, and profitable method than making brass buttons act as sovereigns. The one is every whit as much imaginary as the other, and would represent just the same and no more of fictitious wealth or cash. It may be set forth that A had 1000*l.* in hard cash at his bankers. It is possible, I will allow, that he might as a novelty in this one particular case have placed 1000*l.* in cash or notes to his credit (I admit notes to be pure cash, only they are evaded in days of panic or suspicion), but that amount would soon get into circulation in paying cheques over the counter, and the 1000*l.* cheque sent to B from A is set going by A in business in different sums, and thus we have the real representation of wealth, only instead of thousands it is hundreds of millions that exist only in paper and the imagination of the mind, and accordingly the world travels smoothly along until the muster roll or panic takes place, and opening the eyes of its inhabitants breaks the enchanted spell, awakening too many rudely and roughly from their dream of safety. Yes, and thousands upon thousands of millions of wealth really do exist, but not in money. Look at London alone, the buildings, equipages, jewels, &c., represent almost incalculable riches—in fact, the very ground in the City is reported to be of more value and realise more money than sovereigns would purchase placed upon or spread over it. Fancy less than every square inch realising 1*l.*; but again I say the sovereigns are not placed upon the ground, neither are they counted when the purchase is made, as a bit of paper, a cheque, does the business far more conveniently, and so wonderfully elastic is the imagination respecting wealth, that cheques for millions, where valuable property is being transferred, pass muster just as well as for hundreds or even tens. Thos. J. Barnard.

Tamar Metal Extraction Works, near Tavistock, Oct. 9.

[*To be continued in next week's Mining Journal.*]

THE CHONTALES CONSOLIDATED MINING COMPANY.

Sir,—Now that we are to have a change in the management of the above company, I think it behoves the shareholders to enquire into the position of their property, in view of the discrepancies between Mr. Belt's glowing promises and the meagre results obtained.

We were led to expect most profitable returns from the San Benito East. Now, what are the actual results? In 1871 the total returns of gold were, in round numbers, 4640 ozs.; or, in the eight months ending August, 3111 ozs., against 2437 ozs. for the corresponding period of this year. When the company was reconstituted we were told that ample capital would be available for providing increased stamping power, &c., and we were soon to appear in the dividend-paying list, which desirable consummation seems likely to be indefinitely postponed. If these increased appliances have not been provided I hope some shareholder will, at the forthcoming meeting, enquire "the reason why." If they have, I think, as Mr. Belt's relations with this company as manager are about to cease, that gentleman should be called on to explain how he came to furnish such over-sanguine estimates, so singularly falsified by the results up to the present time. I shall be unable to attend the meeting, but trust that the subject will be thoroughly ventilated. I believe we have a fine property; I have entertained this opinion for some years, during which time I have been, as I now am— A Holder of Several Hundred Shares.

THE TAQUARIL GOLD MINING COMPANY.

Sir,—As Chairman of the Committee of Investigation appointed by the shareholders, whose report has already been circulated, I have received many communications on the subject, and felt it incumbent upon me, as having a more intimate knowledge of the affairs of the company generally than my co-proprietors, to offer a few remarks through the medium of your Journal, before the general meeting, to be held on Monday next. The object of this meeting is to determine the best course to be adopted for the common interests of the shareholders, under the present very discouraging position of affairs; and, after mature consideration, it appears to me there are but two alternatives:—

1.—To obtain fresh capital from the present shareholders to enable further trials to be made at the mines.

2.—To resolve to wind-up the company voluntarily, and appoint a liquidator who will devote his efforts to the interests of the shareholders.

After duly weighing all matters of detail connected with the undertaking, and looking at the very discouraging reports lately received from the mines, and the difficulty of obtaining new capital, I am inclined to think that a voluntary winding-up would be the prudent course, and the one more likely to result in ultimate benefit to the shareholders. It is clear that the company, with its almost exhausted funds, cannot long remain in its present state; and I would, therefore, submit to the shareholders the desirability of passing a resolution at the meeting in favour of a voluntary liquidation, and of the appointment as liquidator of a competent person. The position of the company would then be more easily arrived at, a just conclusion formed as to the best mode of proceeding, and the merits of the mines tested, *if necessary*, by the reports of a practical and disinterested authority. The adoption of this course would not prevent a resuscitation of the concern under fresh auspices, and with sufficient capital, if the mines were found worthy of further trials. I would earnestly ask as many shareholders as can attend the meeting on Monday next to be present, and support in carrying out the plan alluded to.

Great St. Helens, London, Oct. 16. E. J. Bartlett.

THE JAVALI MINE.

Sir,—You give about once a month an account of the ore crushed and profits made by the Javali Mine, but do not state the present price of the shares. The accounts bear out the statement made by the late lamented Dr. Seemann, but do not say when the stamps now at the mine, and which will double the return, are to be at work.—*Bristol, Oct. 17.* S. R.

THE PESTERENA GOLD MINING COMPANY.

Sir,—In the Supplement to the Journal of Oct. 5 I drew attention to the wonderful richness of the Val Toppa portion of the Pesterena Mining Company, as shown in the reports from time to time published, and expressing, I may say, my want of power to account for the small quantity of gold which was sent from it, if so rich; and I now send you the report for last month's contract from Saturday's Journal, signed T. Roberts, which expresses the usual account of its wonderful richness; but then only 255 ounces of gold appear to have been sent. I should like to know how so small a quantity is sent when so much rich ore seems there to be crushed. This part of the mine must have been seven or eight years at work, with plenty of money, I suppose. As a contrast, I send an extract about the Javali Mine, which does not seem so rich, and yet a profit is spoken of.

Oct. 17. A Shareholder.

THE WHITEHAVEN IRON MINES.

Sir,—"One Interested" (in your last) seems very desirous of answers to his queries of Aug. 31, and says that I promised on the 7th ult. to answer them. I merely said that on my return to Truro from St. Just I should be "ready" to answer them, and I did so intend; but a friend of mine having suggested that it was not probable that the writer who called himself "One Interested" was really so, and advised me not to attend to anonymous letters, my purpose was changed. My friend said that shareholders desirous of information concerning the mines should and would seek to obtain it at the office of the company. It seems very likely that the object of the writer is to depreciate the company's property in public estimation. The statements I made in the Journal as to the resources of the mines, &c., were made and published with no sinister motive. I am no shareholder. If "One Interested" thinks that I erred on any point he can follow his own judgment, and not mine, with reference to the same. Will he kindly send me his address?—*Truro, Oct. 16.* R. Symons.

WEST GOGINAN MINE.

Sir,—In answer to "A Holder of One Hundred Shares," I beg to say the value of the lode mentioned in the report to which he refers has not yet been fairly ascertained, as it has not yet been opened out to full width. The mine has been dialled both by myself and another independent and practical mining agent; but it is impossible to say for certain whether or not it is the same lode that yielded so much wealth in the old Goginan Mine. Several miners acquainted with the lode in the old Goginan Mine have seen it.—*Llanidloes, Oct. 17.* John Kitto.

[For remainder of Original Correspondence see to-day's Journal.]

Coal in the Earth.—Prof. Ansted mentions that a quarter of a million of square miles of the earth's surface are covered with sandstones and shales of the carboniferous period, among which coal is buried; and this coal is for the most part accessible. Now, there are upwards of 3,000,000 square yards of surface in a square mile, and assuming an average total thickness of 10 yards for all the distinct seams of each coal field, we find for the total number of cubic yards of available coal the enormous figure of 7,500,000,000,000. As a cubic yard of coal weighs nearly 1 ton, we may say that there are in round numbers 7,000,000,000,000 of tons of coal available for the use of the human race. It we took the average number of human beings living at each moment during the next 3500 years to be 2,000,000,000, and the annual consumption for all purposes to be at the average rate of 1 ton per human being, the supply would last for that enormous period.—*Cornhill Magazine.*

Royal School of Mines, Jermyn Street.

[FROM NOTES BY OUR OWN REPORTER.]

Lecture LV.—We have next to look (continued Mr. Smyth) at a very important matter—the distribution of the air through the workings; and here we cannot fail to perceive how success must be facilitated and assisted by a proper arrangement of the workings. The character of the ventilation also will depend upon the systems of working adopted, which, by the way, are extremely varied, even on the stratified deposits both in this country and on the Continent. I will mention, first, the plan by which a single current of air does the whole duty of ventilation in a mine. This may be done, as we have seen, by spontaneous ventilation, in which by proper management a current may be passed through the entire round of the workings, and do the duty efficiently. In modern times, although only one current at starting, it is divided and passed in different directions, the workings being thoroughly divided into two sides. This duplicate system has considerable advantages. It is extremely simple, and it throws a large current of air into the most dangerous parts, and sweeps away the gas as fast as it exudes, blowers excepted. Many of the large collieries in the North of England used to be carried out on this principle. The ventilating movement was made to run along the face of the workings; it was taken right up by brattices where it was needed, and so a single air current, broken only, perhaps, at one or two places, did all the work. This is somewhat similar to what would happen with the long wall system, but although in long wall the gob is not a series of reservoir for dangerous gases, as it is in pillar working, the air is apt to get dangerously foul before it reaches the upcast, and 150 years ago some tremendous accidents arose from these causes. Mr. Spedding, of Whitehaven, an eminent mining engineer in his day, saw years ago the necessity of carrying the air throughout the entire spaces, and introduced in 1760 a plan of what is called "coursing the air." [The lecturer here exhibited a large diagram of some extensive workings in the North of England, through which the air is "coursed" in pairs of air currents through the whole of the opened passages, so that, in fact, no large spaces of ground were left unventilated.] This was a great improvement, and the basis of all the systems of ventilation in operation down to the present time. The principle, however, was hardly established before the Northern viewers arrived at the conclusion that some means must be devised for shortening the distances travelled over by the air. It happened that according to the extent of the workings a current passing into a colliery under this plan would have to pass 10, 20, 30, or 40 miles before it got out again, and the consequence was that in its lengthened passage it became laden with noxious gases emitted from the seams, and impurities of every kind, and often was so bad as to be explosive. Towards the close of the last century a great deal of attention was given to the condition of the return air, and the result was that it was found desirable to divide the air currents by a system now long known as "splitting the air," the suggestion of Mr. Buddle. His plan was to take the air at the bottom of the downcast shaft, and divide it into as many parts as were required, each part being conducted into a section of the mine stopped off and kept separate from the others. In the intricate network presented by the galleries of a large mine these splits may repeatedly cross each other, and to effect that without disturbing the direction of the currents the return split is passed over the intake by a "crossing." Thus, although each section or panel of a colliery is ventilated by its own off-set from the main current of air, they all unite together at the end of their courses in a roomy air-way, and pass away to the upcast shaft. The balancing of these splits requires extremely nice management, as the air would tend to desert the longer for the shorter runs, and where inequalities of that kind exist it is necessary to put in regulators, which, checking the entry of the air into the shorter forces it into the longer runs. This was an improvement of the greatest importance in many respects. In the first place, it greatly lessened the chances of an explosion, and when combined, as it is now-a-days very frequently, by separating the ventilating areas by extensive blocks of unworked coal, if an explosion were to take place in one panel it would probably not spread to the others; whereas where this system is not adopted an explosion in one working place has swept away every soul present in the whole mine at the time. Moreover, the quantity of air obtained is enormously increased. The capacity of the shaft compared with that of the levels is always greatly larger, and, therefore, by this "splitting" process one portion of the intake goes in one direction, and another in another, until the united volume of the separate currents equals that of the shaft. This may be done to a great extent, and cases are not uncommon in the North in which there are 16 splits.

Splitting the air is a miner's phrase, which, of course, only means dividing one panel from another. I remember reading an article in the *Edinburgh Review*, from which it would appear that strange ideas prevail amongst even learned men as to what is meant by the term "splitting the air," as they seem to have fancied that the division was effected by some sharp means of division of the nature of a knife. In the South of Europe the principle is known, but they only divide the current into two parts, a very weak and inefficient expedient compared with the system in vogue in the North of England, so that there is great room for improvement there. Another point in its favour is the improvement it secures in cases where the workings are uphill.

Under the one-current system the air as it progresses gradually gets warmer, which, taken in connection with the gas it incorporates with itself, makes it specifically lighter than the lower portions of the atmosphere. It passes to the upper end of the bord-gates (as in the case of the Lundhill Colliery—plan referred to), and then has to be brought back downhill to ventilate the banks at the bottom. It then goes through a thirling, passes up the next bord-gate, and then is brought down again to ventilate another face, and so on. The current, therefore, has continually to drag the specifically lighter air downhill. This has led under such circumstances to the accumulation of gas in the upper workings, which, having taken fire, explosions and great loss of life have followed. When an explosion takes place in one of these workings it has been found to strike back, like a train of gunpowder, to the other working places. Lund Hill is, unfortunately, too famous for accidents of this kind; the ground there being extremely productive of gas, which drains off, as it were, to the upper working places, and then if fired the consequences are disastrous in the extreme. This system of working rather favours than otherwise the chances of explosion, and wherever it exists should be changed into some modification of long wall; but by splitting the air greater ventilating power is given to the main air current. In the Belgian collieries the danger arising from the tendency of gas to accumulate in the upper workings is met by what is there called the "ascensional principle" of ventilation. The intake is arranged so as to be taken at once to the lowest point, and conducted upwards through the workings to the shallowest shaft, so that the air is never brought downwards. This might be effected easily enough in the long wall system of this country, by having an upcast pit from the rise. Indeed, at Lund Hill I believe it was intended that there should be a pit on the rise, when probably that colliery would have proved less dangerous. It is doubtful, however, whether in all cases a rise shaft can be made an equally good upcast pit, the power of the furnaces depending considerably upon the height of the column of air heated to destroy the equilibrium. It is a system, however, which is in Belgium imposed upon mine managers by law, although it has not yet passed out of the regions of controversy.

To understand thoroughly the advantages of "splitting the air," it must be remembered that the shaft generally is very much larger in superficial area than the levels; and, in fact, it is only by splitting the current at the bottom, and sending it in different directions, that the full volume of air the shaft is capable of supplying can be utilised. Thus a shaft 10 ft. in diameter has an area of 78·5 square feet; a 12-ft. shaft a 113 ft. area; and a 15-ft. shaft an area of 176·7 square feet. But the area of the drifts, which are generally 5 ft. by 6 ft. in dimension, is 30 ft. only, consequently it is obvious that one shaft can supply several drifts with air. This being so, there is is no excuse for those who still adhere to the old single current system—a system from which innumerable accidents have occurred, and many, perhaps, which have been attributed to other causes. Indeed, it must be obvious to the most casual observer that by keeping too long a run the air will become of itself so bad that it does more harm than good to carry it into the working places farthest off from the downcast, and indeed such workings may in themselves be free from explosive elements, but highly charged with such elements by that current which is brought to them as life-preserving and health-giving, although, in fact, it is nothing of the sort. In all arrangements, however, for the distribution of air, or as the French say, "the airing of mines," there must be kept in view the "dragging," as it is technically called, by the falls of roof or from the sides of the levels which may take place. It is true there may be "wastemen" continually travelling about to remove such obstructions, but they must be taken into account, and particularly as the wastemen cannot be everywhere at once, and a fall (unless it interfered with the carriage of material) might be unnoticed for hours. Supposing, for instance, in a remote part of a mine a fall from the roof took place, arising from a settlement of the adjacent ground, it might check the air to such a serious extent as to interfere with the ventilation. When such a thing takes place it will soon make itself known to the furnace man, if he is a person who knows what he is about; but it may take hours to set things to rights, and meanwhile an explosion might occur. It is, therefore, only by the constant supervision of the men placed in charge that collieries, having in them a large quantity of fire-damp, can be kept in a safe condition, and this is materially assisted by dividing the air into several splits or compartments. In the same way you will see the impropriety of diminishing the size of the air passages; as, for instance, for convenience at a crossing or elsewhere, reducing the passage to a mere trough, or as we see frequently in metalliferous mines, putting in a shoot, and thus interfering materially with the quantity of air that can pass.

If we can ensure the isolation of the panels I have already spoken about a great point is gained. Of course, they will all suffer if any accident happens in the shaft. For instance, when they had brattices in the shaft any accident to that left the ventilation entirely dead. Brattices used to be made with wood, and if they were destroyed by fire, which sometimes occurred, it was impossible to rescue the men in the workings below. But not much less fatal would it be, even where there were two pits, if the main doors between them were blown away, for the natural tendency of the air being to pass by the shortest route, it would in such a case pass from one shaft to another without penetrating the workings at all. It is an established fact that in a large explosion a majority of the sufferers lose their lives not by the force of the blast or the scorching of the flames of the fire-damp, but by the suffocation produced by the deadly after damp, or carbonic acid gas. It would be, therefore, a good thing if a long unbroken run could be maintained from one shaft to another, by means of which the men would have an opportunity if they could reach it from the workings of fleeing for their lives. Such a main drift would be equally useful if, in consequence of an explosion, the currents became reversed for a time—a not unfrequent case, and which, when it happens, hinders the workmen not injured by fire-damp knowing which way they should go in order to escape.

I happened to be on the spot at one of the late catastrophes near Wigan, and I remember that after the first blast had passed off, and two men were rescued near the pit eye, the smoke which was coming up the pit began to hover, and then to show a tendency to pass down again into the pit, creating, as all miners know, the greatest risk of a second explosion. Indeed, the risk in this case was so obvious that no sane man would think of going down again, and all idea of attempting to rescue the men below was for the moment abandoned. It happened that a second explosion did take place, so severe that a number of men were hurt who were near the pit at the surface, and all below perished, those farthest from the explosion having died from choke-damp. There are good reasons connected with the work to be done at the surface for having the upcast and downcast shafts near each other, but the further the two important shafts can be separated the longer could be the independent air course between them by which men might escape, and this course should not be opposed to the natural draught the air would follow when left to itself. It is by these contrivances and by these means—which by the ingenuity and perseverance of the Northern viewers have been thoroughly matured—that such large volumes of air are made to pass through the more extensive collieries, as from 150,000 to 300,000 cubic feet per minute. There are, however, several important natural laws affecting the question of distribution, which before leaving the subject we must glance at in our next lecture.

SALES OF COPPER ORES.

COPPER ORES SOLD AT THE CORNISH TICKETINGS FOR THE QUARTER ENDING SEPTEMBER 30, 1872.

Mine.	Tons.	Amount.
Devon Great Consols	4122	£12,645 11 6
South Caradon	1285	10,480 7 0
West Seton	748	4,810 3 0
Marke Valley	1051	3,875 17 0
Brookwood	668	3,736 9 6
East Pool	704	3,173 10 0
East Caradon	530	2,911 13 6
Glasgow Caradon	385	2,562 15 6
Hingston Down	750	2,452 18 0
West Tolgus	456	2,200 4 6
South Carn Brea	149	2,056 3 6
South Crofty	505	2,020 11 6
Mellanear	369	1,582 4 6
Prince of Wales	265	1,500 0 0
Carn Brea	226	1,471 13 6
Gunnislake (Clitters')	362	1,327 13 6
West Maria and Fortescue	330	1,301 11 0
Phœnix	267	1,253 11 0
South Frances	135	1,207 12 0
Gawton	381	988 5 0
West Caradon	276	988 1 6
West Basset	152	961 14 0
Crenver and Abraham	253	931 12 0
Wheal Friendship	254	911 15 0
Boswidden	147	858 5 0
Wheal Russell	245	675 9 6
Carn Camborne	100	602 5 0
Wheal Seton	139	534 6 0
Craddock Moor	92	478 12 0
Wheal Basset	87	428 17 0
East Seton	77	389 11 0
Wheal Buller	45	388 12 0
Wheal Jewell	80	317 14 6
Wheal Crebor	86	294 0 6
Belstone	22	243 10 0
East Grenville	60	228 4 0
Poldice	44	216 14 0
South Dolcoath	34	203 1 0
Florence and Tonkin	50	191 3 0
North Roskear	17	141 2 0
Champion's Ore	25	135 12 6
Pennance	29	121 1 6
New Lovell	37	119 18 0
Spearn Moor	10	94 17 9
Wheal Grenville	14	55 6 0
West Gorland	5	46 5 0
Pendarves United	5	38 10 0
South Tolcarne	11	28 7 6
Pedn an-drea	8	27 0 0
White and Co's Ore	194	26 8 0
Virtuous Lady	7	15 15 0
Wheal Damsel	5	15 10 0
Williams's Ore	5	4 12 6

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Purchaser.	Tons.	Amount.
Vivian and Sons	3290	£13,006 12 6
P. Grenfell and Sons	1646	11,684 19 6
Sims, Willyams, and Co.	3242	13,270 8 6
Williams, Foster, and Co.	2792	16,800 0 6
Mason and Elkington	1792	7,241 8 3
Copper Miners' Company	1401	4,407 1 3
Charles Lambert	600	2,212 2 3
Sweetland, Tuttle, and Co.	1618	5,834 6 3
Bede Metal Company	111	350 19 6
Total	16,492	£74,807 18 6

COPPER ORES SOLD AT THE SWANSEA TICKETINGS FOR THE QUARTER ENDING SEPTEMBER 30, 1872

Mine.		Tons.	Amount.
	BRITISH.		
Berehaven		1460	£ 9,246 7 6
Knockmahon		379	2,822 8 6
Fursdon		306	1,169 17 0
Bampfylde		59	781 14 0
Union		290	501 0 0
Ballycummisk		57	351 9 0
Dyliffe		84	325 10 0
Cappagh		25	287 0 0
Tigrony		8	186 8 0
Cloncurry		3	103 10 0
Coosheen		6	102 0 0
Total		2677	£15,877 4 0
	COLONIAL.		
Cape		2671	£71,064 9 6
Paramatta		152	2,220 10 0
Concordia		56	1,929 0 0
Australian		37	833 4 0
West Canadian		9	148 10 0
Total		2925	£76,195 13 6
	FOREIGN.		
Italian		219	£ 2,778 17 0
Lisbon		109	2,433 4 0
Sobral		184	1,822 10 0
Norway		79	523 7 6
Telhadella		35	379 0 0
Vannoni		25	255 8 0
Total		651	£ 8,192 6 6
	RECAPITULATION.		
British		2277	£15,877 4 0
Colonial		2925	76,195 13 6
Foreign		651	8,192 6 6
Sundries		648	3,170 19 6
Total		6901	£103,436 3 6

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Copper Miners' Company	399	£ 7,194 8 6
P. Grenfell and Sons	668	7,546 11 0
Sims, Willyams, and Co.	2062	20,512 17 0
Vivian and Sons	1200	28,283 11 0
Williams, Foster, and Co.	1169	11,627 14 0
Mason and Elkington	252	6,802 3 0
Charles Lambert	335	9,213 8 0
Sweetland, Tuttle, and Co.	369	4,318 2 0
Landore Copper Company	447	5,937 9 0
Total	6901	£103,436 3 6

Cornish Pumping Engines.—The number of pumping-engines reported for August is 20. They have consumed 2248 tons of coal, and lifted 16·9 million tons of water 10 fms. high. The average duty of the whole is, therefore, 50,700,000 lbs., lifted 1 ft. high, by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

Chiverton Moor—70 in.	Millions	54·4
Crenver and Wheal Abraham—Sturt's 90 in.		56·2
Ditto —Pelly's 80 in.		65·8
Ditto —Willyams's 70 in.		63·5
Dolcoath—85 in.		63·0
Great Work—Leed's 60 in.		59·0
West Chiverton—New 80 in.		58·2
West Wheal Seton—Harvey's 85 in.		65·0
Wheal Seton—Tilly's 70 in.		58·5
Ditto —Tregonning's 70 in.		62·0

New Blasting Compound.—Mr. J. P. R. Poch, of Brussels, chemist, employs in the manufacture of his new blasting compound, or "pudrolythe," the following ingredients, by preference, in the proportions mentioned, though these proportions may vary according to the quality of the compound required. For 100 parts by weight of the compound take—3 parts by weight of spent tan, 5 of wood saw dust, 3 of nitrate of soda, 3 of nitrate of baryta, 6 of charcoal, 12 of sulphur, and 68 of saltpetre, all which ingredients are used in a powdered state, dissolving the nitrate of soda and the nitrate of baryta, together or separately, in hot water, and when completely dissolved add to the solution the tan and saw dust above mentioned, and allow them to boil, or evaporate, till the tan and saw dust have absorbed all the liquid, and the whole has become quite dry; then add the other ingredients above mentioned, and mix the whole together in a rotary chest, or cylinder, or other suitable mixing apparatus. When properly mixed and prepared the compound is of a dark-green colour, and may be used for blasting, in the same way as ordinary gunpowder, without the risk of those dreadful accidents which frequently occur in this operation when an explosive compound is used.

Grinding Ores.—Mr. D. Stevens, of Godolphin Mills, Cornwall, metallurgist, has invented some improvements in and connected with apparatus or machines for grinding or reducing ores and mineral substances. This relates to apparatus or machines (suitable for wet or dry grinding, principally the former) having a similarity in their general motions to ordinary horizontal millstones and appliances used for grinding grain.—1. The bed grinding surface is formed of combined hard and soft metal, and the runner of hard metal; or the bed is of one quality of metal and the runner of another. Iron is preferred.—2. The grinding

surface of the bed is concave and the runner convex.—3. The leading edges of the shoes of the runner are bevelled at the furrows or separations, and led from eccentric points at the eye to the skirt.—4. The runner is formed with through opening, so that feeding may be done through them as well as through the eye.—5. A sleeve rises from the bed upwards near to the top of the driving spindle, and is covered by a thimble, which couples to the runner, for the purpose of preventing escape and damage.—6. The finely ground material in wet grinding is allowed to flow through an annular opening between the case and a rising piece from the runner, such opening being near the centre, so that only finely-ground articles shall be delivered.—7. The case is adjustable in wet grinding, so that by raising or lowering it the substance will be discharged into a finer or coarser condition.

LIFE OF RICHARD TREVITHICK.

The second volume * of the Life of Trevithick, the first of which was referred to in the Supplement to the *Mining Journal* of July 20, continues the narrative of his inventions from 1804 onward. About this time Capt. Trevithick put up in Dolcoath Mine a stone-crushing mill, having large cast-iron rollers for breaking into small pieces the large stones of ore; it was spoken of as the first ever used for such a purpose. Driving rolling-mills, it appears, was among the early applications of the high pressure steam-engines, but pulverising hard rock by the use of hard rollers was a novelty; and though his patent of 1802 shows the proposed rolls driven by steam for crushing sugar canes, yet no one had dreamt prior to 1804 of economy of crushing stone and clay by such means; the plan, however, remains in use to this day in many mines, and is frequently spoken of under the name of quartz-crusher. Trevithick worked hard and successfully in making his steam-engine useful, and firmly believed that he could and would make them universal labourers. Even the Spanish merchants, unacquainted with steam, talked of giving an order for several engines for South America, and their glowing account of the wide field open to him may have been instrumental to his going to that country by making his engines known there. His proposal to make the sugar cane convert itself into sugar by the use of his patent high-pressure steam-engine may, says his biographer, be more theoretical than practical, but many more unlikely things have come to pass.

But perhaps the most important claim put forward for Trevithick is that he is really the inventor of the system of aerating steam, the merit of originating which is now disputed by Messrs. Warsop and Galloway; and it even seems that he would have gone further than either, for in a letter written in 1811 to Mr. Giddy, in which he gives a rough sketch of his proposed arrangement, he says—"But suppose the idea to be carried still further by making an apparatus to condense and take the whole of the heat into the cylinder instead of its passing up the chimney. By having a very small boiler and a blast-cylinder to blow the whole of the blast into the bottom of the boiler under a cylinder full of small holes under the water to make the heated air give all its heat to the water. The furnace must be made in a tight cast-iron cylinder. Both the fire-door and the hole through which the blast enters must be quite tight, as the pressure will be as strong in the fire-place as in the boiler. The whole of the air driven into the fire-place with all the steam raised in it passage up through the water in the boiler must go into the cylinder. There will also be the advantage of the expansion of the air by the heat over and above what it was when taken cold into the blast-cylinder. From the great quantity of coal burnt in blast-furnaces you will find that a very small blast-cylinder would work a 63-in. cylinder double. If there be as much heat in a square foot of air as in steam of the same temperature, the saving will be beyond all conception." The idea was submitted to his friend Davies Giddy, who pronounced an unfavourable opinion upon it, and the matter seems to have dropped, as, it might be added, it no doubt will again.

Again, it was at Mr. Richards' flour-mill that the systematic burning of smoke was first attempted, and it was Trevithick who directed how it was to be done—the fire was to be kept much thinner at the inner end of the grate bars than at the fire-door end, so as to allow the free passage of air through the thinner layer of coal near the fire-bridge, causing the combustion of the passing gas. It was his opinion in 1812 that every part of agriculture might be performed by steam—carrying manure for the land, ploughing, harrowing, sowing, reaping, threshing and grinding, and all by the same machine, however large the estate. In the same year he stated in a letter to Sir Chas. Hawkins that the expense of an engine delivered in London of power equal to 40 mules (or four teams of 10 mules working six hours in every 24) would be 200*l.*, and that it would consume 13 or 14 bushels of coal in the 24 hours, and waste about 15 gallons of water, unless a reservoir was made to receive the steam, when the same water could be worked over again with scarcely any loss. He also pointed out that engines that had been sent to the West Indies hitherto had cost nearer 2000*l.*, very large, heavy, and complicated machines, requiring 2500 gallons of water per hour for condensing, and could only be managed by a professed engineer, while any common labourer could keep in order and work his engine. With regard to steam threshing in Trevithick's time, it appears that one of his engines, belonging to Lord Dedunstanville, in 1813, threshed 1500 sheaves in 90 minutes with 40 lbs. of coal.

The chapter upon Peru is a highly interesting one, showing that even under the Viceroys the Peruvians displayed great energy in connection with mining upon the associated principle. The mines of several districts being much troubled with water, a contract was made for carrying out a combined system of drainage by means of steam-engines to be taken from England. It was arranged to drain to the depth of 40 varas (or yards), and the representatives of Trevithick are naturally proud that his system of high-pressure steam and no vacuum should have been preferred to Watt's engines with low-pressure steam and vacuum. His successes at the Cerro de Pasco Mines are detailed, and the account of his adventures in the country subsequently cannot fail to excite interest.

The remaining portion of the volume is devoted to the description of some other of Trevithick's inventions, and as we notice carbines, gun-carriages, bottle-neck boilers, and other things, it is evident that his great inventive genius has never been over-estimated. There is doubtless much in the volumes which might be utilised by the inventors of the present day, and much that would prevent them falling into errors which are but too apparent upon the inspection of their inventions. The volumes certainly deserve extensive circulation for their intrinsic worth, apart from the consideration that they at once reflect honour upon Trevithick, and credit upon his biographer.

* "Life of Richard Trevithick, with an Account of his Inventions." By Francis Trevithick, C.E. London: E. and F. N. Spon, Charing-cross.

LE BOULENGE, AND BALLISTIC CHRONOMETRY.

There is scarcely a branch of science or industry the progress of which cannot be almost directly traced to the popularising of instruments of precision, and frequently (as in the case of the steam-engine, which could never have been brought so nearly to perfection as it is at present but for the introduction of those really beautiful instruments of precision—machine tools) the construction of some particular instrument of the class discovers a field for inventive efforts which ultimately lead to results of paramount importance to the whole community. The use of the chronograph has hitherto been comparatively limited, but the more extended knowledge of the cheaper and more simple instrument may facilitate its application to many purposes for which it at present not thought of. Captain Michaelis has certainly rendered an important service to all English-speaking people in giving us so complete an account of the Le Boulengé Chronograph,* which it will be admitted is one of the most ingenious and philosophic that has been devised; it is, as Capt. Michaelis informs us, employed to the exclusion of all others in Belgium, Holland, Prussia, and Russia, and has likewise been adopted in Spain, England, Italy, Sweden, Austria, Turkey, and Portugal.

Like all the successful instruments of the same class, Capt. Le Boulengé's instrument is based upon the use of electricity as the determining agent; the time between two events is ascertained by noting the distance of the *free* fall of a heavy body during the interval, the beginning and the end of this distance being made to accord with the occurrence of the events by means of the galvanic current. He very properly describes the Schultz Chronoscope (an instrument the accuracy of which is beyond question) as too delicate in its details for ordinary use, and shows by comparing the results obtained with the two instruments that in the Le Boulengé, although a pendulum instrument, the method of suspension is so perfect that the differences in the figures obtained are practically inappreciable; whilst the Le Boulengé instrument has the further advantage that, unlike other chronographs, it expresses the velocity *at once*, by the very measurement of the fall; in other words, the velocities are the units of the scale of measurement. To obtain velocities at once two electric circuits are established a fixed distance (say, 50 metres) apart, in such a manner as to be successively broken by the projectile in its flight. The first current circulates through an electro-magnet, whose armature is a long cylindrical rod called the "chronometer," furnished with two enveloping zinc tubes called "recorders." The second current passes by a second electro-magnet whose armature, a shorter rod, is called the "registrar." The third active element of the instrument is the "indenter," consisting of a circular knife fixed in a main spring, which can be cocked by means of a catch on a suitable lever. On the breaking of the first circuit the chronometer falls vertically; on the rupture of the second the registrar falls in its turn, depresses the free end of the lever, and thus releases the main spring; the knife juts forward, strikes the falling chronometer and indents the upper recorder; a moment's thought will show that the lower the velocity the higher up will the recorder be indented.

The theory of the instrument is next explained, and minute details are given as to the best method of using it in order to ensure the greatest possible facility in setting it up ready for the experiment. At Watertown arsenal a solid concrete pier has been constructed whereon to use the instrument, and thus necessity for re-adjusting the instrument is reduced to the minimum, but as it might not always be employed in an equally favourable position, the method of determining how the re-adjustment can be most rapidly effected is carefully given. The adjustment of the Le Boulengé chronograph presents but little difficulty, and it has the great advantage that unless wilfully it cannot be set up to record inaccurately, for, as Capt. Michaelis remarks, it is always regulated by a fixed standard whoever may be the operator—a very great advantage in practice, as all errors arising from "personal equations" are thus eliminated. But probably the best evidence that can be offered of the reliability of the instrument is that which is derived from the inspection of the very useful table which Capt. Michaelis gives, showing the simultaneous results obtained at Watertown arsenal with the Schultz and Le Boulengé instruments. Frankford arsenal service cartridges, various dates of manufacture were fired from the Springfield musket, model 1870, and the initial velocity was taken by both instruments simultaneously. The records were taken of 58 shots, and the mean (arithmetical) velocity was found by both instruments to be 1225 feet. The difference of velocity appeared to be 14·2 feet by Schultz's chronoscope, and 13·9 feet by Le Boulengé's chronograph. The probable error in the mean result was estimated to be 1·65 feet by Schultz, and 1·68 feet by Le Boulengé, and the mean variation of the instruments was 5·3 feet; in the case of five of the shots the record was identical by both instruments, and in five others the record varied but a single foot, so that the chronograph cannot be regarded as wanting in accuracy. In another series of experiments in which Remington-Martin cartridges were fired from the Remington musket, the result was equally satisfactory, the mean variation of the instruments being but 4·3 feet.

To render the work complete, Capt. Michaelis has given several beautifully executed plates of the chronograph and its details, as well as elaborate tables for finding the times corresponding to falls increasing from 1-10th of a millimetre to 530 millimetre, and for finding the height corresponding to velocities calculated for a disjunction time of 0·15 second, and an interval of 100 feet between the targets. Capt. Michaelis observes that the chronograph, on account of its accuracy, simplicity, portability, and cheapness, is peculiarly well adapted for issue to artillery posts, and yet its capabilities are so great that it may be used in our most refined ballistic experiments; it requires no special arrangements in its setting up, and any person of ordinary intelligence may be taught its mechanical manipulation. We need only add that although the instrument may be entitled to all the credit for simplicity which Capt. Michaelis gives it, the facility for using it and recording the results with accuracy and rapidity, will be vastly increased when his book accompanies it.

* "The Le Boulengé Chronograph." By Brevet-Captain O. E. Michaelis, First Lieutenant Ordnance Corps, U.S.A. New York: D. Van Nostrand, Murray and Warren Streets.

Journal of the Iron and Steel Institute.—The August number of this journal contains a full report of the meeting of the Institute held at Glasgow on Aug. 6, including the several papers read. The abstracts of them were published in the *Mining Journal* at the time of the meeting; but for refreshening the memory of those who may desire to read them it may be mentioned that the volume contains the papers "On the Geological Position and Features of the Coal and Iron Bearing Strata of the West of Scotland," by Mr. James Geikie, F.R.S.E., with the discussion thereon; "On the Rise and Progress of the Iron Manufacture in Scotland," by Mr. John Mayer, F.C.S., in which credit was claimed for raw coal having been first used for the manufacture of iron. Mr. Menelaus and others having somewhat questioned the fact, and claimed priority for Darby, the authorities have since been looked up, and it seems that Dr. Percy (p. 888) says that Abraham Darby, 1730-35, "determined to treat pit coal as his charcoal-burners treated wood," . . . and that "having thus made a good stock of coke he proceeded to experiment upon it as a substitute for charcoal." The next paper is on "Napier's Differential Friction Gear for Reversing Rolling Mills," by Mr. R. D. Napier; in addition to which there are papers "On Reversing Rolling Mills," by Mr. Graham Stevenson; "On the Rise and Progress of Iron Shipbuilding on the Clyde," by Mr. D. Rowan; "On Patent Three High Plate and Sheet Rolls," by Mr. B. L. Louth, of Pittsburg; "On Further Improvements in Spencer's Revolving Puddling Machine," by Mr. A Spencer, West Hartlepool; "On the Westward Development of the Iron Manufacture of the United States," by Mr. T. G. Smith, of Philadelphia; "On the Generation of Heat during the Bessemer Process," by Professor R. Akerman, of Stockholm; and "On the Utilisation of Blast Furnace Gases," by Mr. J. J. Bodmer. The quarterly report "On the Progress of the Iron and Steel Industries in Foreign Countries," by Mr. David Forbes, F.R.S., the foreign secretary of the Institute, contains an enormous mass of information. There are likewise good reports of the Proceedings of Scientific and Technical Societies; Notes of the British Iron and Steel Trades; and Notes on the Forthcoming Universal Exhibition at Vienna.

THE WILLOUGHBY SPRING STAMPS.

For some years past efforts have been made by manufacturers of mine machinery to substitute the steam-hammer principle for the ordinary free fall system in the construction of stamps, but the necessity of a separate cylinder for each stamp has proved so great an obstacle that the general introduction of them has been unpracticable, especially as the majority of practical men entertain the opinion that when each head is made to fall more than 15 or 20 times in the minute it is rather a disadvantage than otherwise—that is to say, that the extra amount of work done is not at all in proportion to the extra power consumed. With a view to secure greater efficiency and increased economy in the forging of iron, Mr. Justice, of Philadelphia, designed a dead-blow steam-hammer, which gave great satisfaction in use. In consequence of this, Messrs. Willoughby, of Plymouth, sought to apply the principle in connection with stamps for the treatment of tin, and have entered into a contract for erecting 40 of their new spring stamps at the Terras Mine, near Grampound-road, and on the occasion of the meeting of the shareholders, reported in last week's *Mining Journal*, the first four stamps were set to work.

At the preliminary public trial, about two months since, it was found that, although the results obtained were not unsatisfactory, there was abundant room for improvements in detail. The consequence was that four entirely new heads were now worked, and Messrs. Willoughby may well be congratulated upon the success of the modifications they have introduced, for it is found that the alterations give greater simplicity and more rigidity to the stamps, and it is said that the power of each stamp is increased from that of 8 or 10 old heads to that of 10 or 12. In the first machine the spring was intermediate in the shaft, but now it is attached sideways, by a strong boss forged in the shank. This, with the improvements introduced in the guides, gives much greater steadiness; and, as the spring has been strenthened, and the bearings placed beyond the reach of grit from the coffer, the apparatus is much less liable to injury. Another great improvement consists in arranging the heads in pairs, the four stamps now under consideration working as two pairs from one shaft. the strain upon which appeared to be very nicely equalised. The whole four stamps were worked by a handsome little portable engine, by Barrow and Stewart, of about 6 or 6½-horse power: it was of 11-in. cylinder, and 14-in. stroke, the pressure of steam used being a little over 20 lbs.

The smoothness with which it runs is admirable; each head made about 108 strokes per minute, and, as the fall was over 20 in., the stamping-power must be enormous. The coffer, with a discharging area of 10 ft., was fitted with skeleton grates, behind which were No. 45 grates. The entire weight of the head and rod is under 3½ cwts.; yet such is the power of the springs that the blow was considered equal to that of a 12-cwt. stamp; so that Messrs. Willoughby would seem justified in claiming that in their spring-stamps Cornwall possesses a machine which is alike theoretically correct in principle and thoroughly efficient in practice.

NEW STAMPS.

Messrs. Donald, Atkey, and Co., of Cornhill, have patented a new stamping principle, and have recently sent a machine down into Cornwall for the purpose of having its capabilities thoroughly tested, and Mr. Sturgeon, an able engineer, to set it up and look after it. The mine on which it has been erected is New Dolcoath, formerly Camborne Vean, adjoining Dolcoath. Its existence there was only known to a few in the neighbourhood until this week, when a trial of it took place. Mr. Fraser, the Chairman, Mr. Comyn, the secretary, and Mr. Thomas, one of the directors of the company, went down from London to witness the result, as on this would depend whether the company would purchase this or other stamps, and they were also desirous of being in a position to compare the relative merits of the different new stamps now competing for public favour. Husband's pneumatic stamps have been gaining considerable ground in the county recently, notwithstanding the objections which have been urged against them as to the amount of friction in the working, and as to an unnecessary waste of power in the pneumatic principle. Willoughby's stamps have also been making some noise, and given entire satisfaction at Terras Mine, where they are being erected in pairs as fast as possible, those put up recently showing a very decided improvement upon the first pair. According to the agents at Terras these stamps will effect a saving of 30 per cent., but the makers claim for them a saving of 75 per cent. in fuel. It was, therefore, wise that the owners of any new mine wanting stamps should take the trouble of ascertaining which of these inventions was likely to prove the most economical and efficient. The old and costly stamps appear now to have but few friends left, and cheaper and more efficient machines have long been felt as a great want in mining. As is frequently the case, several minds have been exercising themselves in the same direction to supply the want, and the result is that we have now three competing inventions, the last of which we are inclined to think will prove to be the best. The trial of this new machine, which we believe has not yet been christened, or given any particular name, took place on Wednesday, in the presence of the gentlemen named, besides several local gentlemen. One can, however, hardly conceive more disadvantageous circumstances than those under which the trial took place. The machine had no fair play; and, in the interest of the owners, it is almost a pity that the experiment was not postponed until better conditions were obtained. The boiler, a tubular one, standing on end, and the machine had to be placed on level ground, and the consequence was that that the boiler was higher than the steam valve of the machine. The result of this was that priming took place to such an extent that the motion was of the most erratic character, and the hot water which passed the steam-valve was forced through every joint. Everything was put up in the most temporary way in the open air. This being so there would, of course, be a great waste of heat from the boiler and pipes, and there could be no fair test of the consumption of coal. The arrangement for feeding was a very defective makeshift, and we had almost made up our minds that the thing was going to prove a dead failure. After working a little while, however, it got rid of the hot water in the cylinder to a large extent, and it began to thump away at the rate of from 150 to 160 strokes a minute. The principle is very much that of the steam-hammer, and it has been applied in a way which promises ultimately to be very effective. One very important point to notice is that there is nothing about the machine to get out of order. All is of the most simple and substantial character, as machinery should be for a work of this sort. The cylinder is suspended, as it were, from a strong iron frame. The piston-rod is fixed to the top of the frame, and the cylinder, instead of the piston-rod, moves up and down, having at its head the hammer or stamp-head. This cylinder is made very strong. It is 7½ in. in bore, and has a 9-in. stroke, and the hammer is 10½ in. in diameter. The steam is conveyed through the piston-rod into the cylinder, in which are valves, and it has a very graceful rotary motion after the blow has been struck, this motion being given for the purpose of wearing the stamp-head evenly all round. The head weighs 6 cwt., and the pressure of steam is reckoned at an additional ton, so that with the velocity the blow will be equal to about 1½ tons. That it was a very heavy blow those who stood near the machine could testify. The anvil on which the hammer beat rested on a hydraulic basis, which showed the highest means of resistance. About half a ton of very hard tinstuff was stamped by the machine, and put through a No. 36 grate, about the finest used. The size of the grate is, it should be remembered, a very important element in tests of this kind, and is not at all times sufficiently considered. The time occupied in doing this work, notwithstanding all the disadvantages to which we have referred, was about 55 minutes. This would be equal to 10 or 12 heads of the old stamps, and all who witnessed the operation must have felt that the machine, with fair play, was capable of doing very much more, if not double, the work, as the owners calculate upon. The steam being applied direct to the striking force there is no waste of power, and it is impossible to conceive a machine where there would be less friction. It is confined to that which may take place by the action of the piston rod in the cylinder, which must be very small indeed. There is no possibility of grit hindering this machine in any way. The round stamp-head works in a round coffer, which has a grating space of 380 square inches, and the grates are slanting, instead of perpendicular as usual. This is thought by some to be an advantage, and by others a disadvantage; but it is a matter of detail which, if wrong, can readily be remedied. It was acknowledged by the agents that the stuff came out as freely and as well as under the old stamps, which is a point of some importance. It is calculated that not more than 40 lbs. of coal will be requisite to stamp by this machine 1 ton of tinstuff; but, as we have already said, there was no fair means of testing this point. This and other points of expense will have to be decided hereafter; but we fully think that we are not making a very hazardous remark when we say we predict for this machine a great success; and we would strongly advise companies who contemplate erecting stamps to see this machine at work for themselves before they make their outlay.

At a meeting which took place in the account-house afterwards Capt. W. C. Vivian, who occupied the chair, said they were bound to render every assistance to any invention offered to introduce material economy in the reduction of their tinstuff to the form in which it was presentable to the smelters. He also spoke of the energy and zeal of Mr. Sturgeon in endeavouring to get the machine into a practical form.

Mr. Sturgeon said the only question that remained to be solved was the consumption of coals, and he could show them very plainly that there would necessarily be very much less coal required by this machine than by any other process. When the difficulties they were now labouring under were done away with he believed they would fully realise their anticipations. He felt bound to express his deep sense of the kind assistance he had received from Mr. Vivian and Capt. Clymo.

THE HOLCOMBE VALLEY GOLD MINING COMPANY.

These mines are located in the Holcombe Valley mining district, San Bernadino County, California, about 20 miles in a direct line and 65 miles by wagon-road from the town of San Bernadino, and 130 miles from Los Angelos, a seaport town of 12,000 inhabitants, between which port and San Francisco a line of ocean steamers ply, making the trip in 48 hours. A railroad is also being constructed between these two points, 200 miles of which is already completed. This road will connect San Francisco with the Southern Pacific Railway, the line of which will pass within 30 miles of the mines.

The property consists of a series of seven parallel gold quartz veins or lodes, each containing a lineal extent of 1200 ft., and as all of the principal veins are within a radius of 600 ft. they can be developed and worked through one and the same vertical shaft. They are all true fissure in character, encased in granite formation, and are located near the summit of a spur of the Sierra Nevada Mountains, about 6000 ft. above the level of the sea. Immediately below the mines, and belonging to the purchasers, there is an extensive and rich deposit of auriferous gravel, which has been worked more or less since 1864, yielding a large amount of placer gold, similar in character and fineness to that extracted from the quartz veins, and the most rational conclusion is that the gold found in this gravel deposit must have come from decomposed surface portions of this series of veins or lodes, which more particularly described are—

1.—The Olio Lode, which has on it a horse-whim and a vertical shaft, 185 feet deep on the vein. At a depth of 100 ft. levels have been run each way about 100 ft., and the ore stoped out to the surface. No stoping has been done below the 100 ft. level, as water was encounted at that point, but the ledge is fully 2½ ft. wide all the way down, regular, and unbroken.

2.—The Mammoth Lode has two incline shafts 300 ft. apart, one 120 ft. and the other 105 ft. deep. At the depth of 60 ft. levels have been run about 250 ft., and the ore stoped out, the ledge being well-defined, and averaging 3 ft. wide.

3.—The San Bernadino Lode has one vertical shaft on the vein 110 ft. deep and two others about 20 ft. deep. Levels have been run each way 50 ft. from the bottom of the 110 ft. shaft, and the ore stoped out to surface, the vein at all points being regular and unbroken, 3 ft. wide.

4.—The Pine Tree, Eclipse, North Lead, and South Leads are but slightly developed, being about 12 to 18 in. wide, but carrying ore of a very high grade.

The machinery on the property consists of an eight-stamp mill, in which all the ores thus far taken out have been reduced, but which is now worn out and comparatively valueless, save the boiler, which is new, and of sufficient capacity to run a 15-stamp mill. Attached to the mill machinery is a saw, which will turn out 5000 ft. of lumber per day. There are also on the property two boilers, engine, and pump, which were used in an ineffectual attempt to drain the auriferous gravel bed above referred to; they are, however, of ample power to run the hoisting works and drain the mines. There is also a substantial two-storey building on the property, suitable for a boarding house and office, with wood and timber in the greatest abundance right at the mines, and water ample for milling purposes within 500 ft. of same.

All the ore taken out from the different mines (some 10,000 tons) has been treated in the eight-stamp mill referred to just as it came from the mines, without selecting, and none has yielded less than $12 per ton, and some of it has run up to $40, $50, and $60, making the average about $15 to $30 per ton. Five horse arrastres are now running on the ore, which is averaging over $25 per ton.

It is at first proposed to erect a 20-stamp mill, with power for 30, and place the mines in thorough working order, utilising the boiler of the old mill for the new, and the boilers, engine, and pump, above-referred to, for hoisting works, to drain and work the mines. With the saw-mill and timber so near at hand it is estimated that the cost of erecting the mill and placing the machinery all in working condition will not exceed 10,000*l.* This will leave 4000*l.* for sinking a main vertical shaft, through which all of the mines will in future be worked. In the meantime sufficient ore can be taken out from the present levels to more than supply the mill for years to come. It is estimated that a 15-stamp mill will treat 25 tons of ore per day, at a cost not to exceed $6 per ton for milling and mining, which will give the following results, estimating the ore at $15 per ton, which is much below the average:—15 stamps treating 25 tons, yielding $15 per ton, $375; cost of milling and mining 25 tons, at $6 per ton, $150; net profit per day $225, or 45*l.* Net profit per annum of 300 days 13,500*l.*, being over 33½ per cent. on the capital stock.

FOREIGN MINING AND METALLURGY.

An advance of 1*l.* per ton has been noticed at Paris in Chilian copper in bars, and of 3*l.* per ton in tough English. Chilian, in bars, delivered at Havre, has made 89*l.*; ditto in ingots, 95*l.*; ditto tough English, 93*l.* per ton. At Havre quotations for copper have been to a great extent nominal. At Marseilles business has been restricted, and displays a good deal of uncertainty. In Germany the dearness of money has weighed heavily on business; nevertheless at Cologne the article appears to be somewhat firmer. The price of tin has been tending downwards at Paris. Banca has made 168*l.*; Straits, 162*l.*; and English, 160*l.* per ton. Marseilles shows a fall of 2*l.* to 4*l.* per ton. At Rotterdam, Banca is maintained at 92 fls., and Billiton at 89½ fls. At Hamburg there has been some demand for local consumption; but at Cologne, Berlin, and Stettin a downward tendency has prevailed. At Paris, there has been a slight improvement in English lead, which has risen to 21*l.* 8s. per ton. In consequence of scanty arrivals an upward tendency in lead has continued to be observed at Marseilles. Cologne has also been advancing, and at Hamburg lead has found purchasers at fully late rates. The Berlin lead market has remained without appreciable change. There have been few variations in zinc at Paris. Silesian, delivered at Havre, has brought 24*l.* 16s.; other good marks, 24*l.* 8s.; and ditto, at Paris, 24*l.* 16s. per ton. The Marseilles zinc market has remained without change.

Numerous and pressing orders are stated to have reached French ironmasters on foreign account. A good deal has been also passing in Bessemer steel, and the productions of this metal, which France manufactures upon favourable conditions, appears to be increasing almost every day. The Orleans and Rouen Company is about to establish a Bessemer converter at the Rouen forges, which it has purchased; the company also intends to convert its new establishment into vast workshops for the construction of railway plant. The manufacture of rolling stock is at present one of the most flourishing branches of French industry. Notwithstanding the great number of new workshops which have been fitted up during the last two years, the activity which prevails in them, and the number of companies which cannot obtain what they want, prove that the means of production are still insufficient. Further, the idea which is becoming every day more general of admitting the trucks of private individuals upon the lines of railway companies appears to guarantee an excellent future to railway plant manufacturers.

The Belgian coalowners have more orders offered to them than they can accept; prices are as high as possible, and the coal trade would be in a state of the highest delight if working miners could only be obtained in sufficient numbers, and if strikes, which continually threaten production, could just now be stopped for a time. But these conditions are not actually realised; a large number of miners who are otherwise employed during the summer are expected to return as usual to their winter work, but it is none the less true that everywhere a want of labour is experienced. Those miners who remain at the pits work as little and take as much pleasure as possible. Strike difficulties in the Liége basin have agitated the Belgian coal trade, and as if to fill up the Belgian coalowners' cup of trouble, there are complaints of a scarcity of trucks and transport *matériel* upon the Belgian State lines. It has been the same with the Great Central Belgian Railway. All these circumstances taken together, induce apprehensions in connection with winter supplies, and help to raise prices to a level which producers themselves find too high. Freights from Charleroi to Paris remain at 8s. 10d. per ton.

There is little fresh to report with respect to the Belgian iron trade. The situation remains much the same; there is a fresh advance in pig, while as regards other articles high prices are maintained. Blast-furnace proprietors and iron manufacturers display considerable prudence in dealing with long-termed contracts, which

are proposed to them almost every day. There is a growing conviction that prices cannot be carried much higher than at present, more especially as the upward movement has been checked in England. The basis price for merchants' iron is about 12*l*, 16s. per ton, while No. 2 plates make 18*l*. per ton. Sheets are spoken of at 16*l*. per ton, but the more current quotation is 15*l*. 4s. per ton. The reports of MM. Tahon and Tasken, the Belgian delegates sent to report upon the Danks process in England, are very favourable, and the furnace is about to be introduced at several continental works—by M. Unga, at Motala, in Sweden; by M. de Wendel, at Hayange, in Alsace and Lorraine; and by M. Dallemagne, at the Sclessin Works, near Liége. Transactions in rails are rather rare, but this arises from the fact that the production of the rolling-mills is engaged for some time beforehand. At the last adjudication for rails for the Belgian State lines no tenders were submitted by Belgian firms, and the administration of the lines is stated to have now concluded contracts with English firms at 14*l*. 8s. per ton for iron rails, and at 18*l*. per ton for steel rails; the conditions as to delivery and guarantee have not transpired, but it appears probable that the English firms have not accepted all the clauses of the severe *cahier des charges* to which the Belgian ironmasters who declined to send in tenders objected. The management of the Belgian State lines was more fortunate in obtaining tenders for carriages and vans. The South of Charleroi Blast-Furnaces and Ironworks Company has been paying a dividend for 1871-72 at the rate of 3*l*. per share.

A great scarcity of coal is experienced in France; the scarcity applies to Belgian as well as to French coal, and it does not appear probable that larger supplies of English combustible will come to hand, although Admiral Pothuan, the Minister of Marine, has just addressed to the Chambers of Commerce on the French coast a circular from which it appears that, according to information collected from a delegate of the Leith Chamber of Commerce, French ships which brought cereals to Scotland might bring back coal as a return freight. Admiral Pothuan observes, in his circular, that the price of coal appears likely to be carried to a still higher point, and he recommends French shipowners who may decide on bringing cargoes of English coal to the French shores to give their orders beforehand in England; otherwise their ships may have to wait three weeks in English ports before being loaded. Meanwhile, the scarcity of coal is so great in France that some works in the Nord will be blown out, coke being not only at an exorbitant price, but also extremely difficult to obtain upon any terms in the chief centres of production. This arises from a want of labour rather than from any other cause; the number of workmen has considerably diminished, and those who remain, although better paid, work less. Emigrants from Alsace and Lorrane, who directed their attention to coal mining in France, would be sure to find work at present. Altogether, the winter commences for the French coal trade under rather troubled and gloomy auspices. The Bességes Collieries Company commenced the payment on Tuesday of an interim dividend of 4 per cent. for 1872. The Graissessac United Mines Company is now paying balance of dividend for 1871.

FOREIGN MINES.

St. John del Rey.—Morro Velho, Sept. 17: Morro Velho produce for August, 956 oits., from 516 tons of ore; yield, 1·759 oits. per ton. Morro Velho cost for Augus, 264*l*.; profit for August, 127*l*. Gaia produce for August, 908 oits., from 516 tons of ore; yield, 1·759 oits. per ton. Gaia cost for August, 367*l*.; Gaia loss for August, 5*l*. Sinking in the new shafts 15 days in September—A, 1 fm. 3 ft. 0 in.; B, 1 fm. 3 ft. 6 in.. The sinking has been carried on steadily, though some days have been lost in effecting necessary repairs to pumping wheel.

Don Pedro.—Report for August: Produce, 4682 oits., at 8s. 6d. per oitava, 1989*l*. 17s.; cost, 3399*l*. 14s. 9d.; loss, 1409*l*. 17s. 9d. No change to report in the quality of our stoping ground. For a time, and until the deeper drainage be effected, we are limited to reserves. Permanent pumping machinery is being energetically pushed forward, as is also the erection of jigging machinery. Explorations carried on without anything fresh to report.—Extract from letter dated Sept. 18: Produce to date, 1506 oitavas. I regret that the ores extracted from our stopes continue of low quality; this month they have been principally extracted from No. 8 shoot. In reply to my constant demand for better stuff, the mining captains reply that we must be content to await the result of deeper drainage, and that all that is possible to do is being done. A reduction of permanent incline in size has been effected, and the incline is being carried on to reduced dimensions.

San Pedro.—Richard M. Kitto, Aug. 30: The new shaft is sinking below the 135 by eight men; ground favourable and water very easy; we are making good progress.—New End: The 135, driving north 58° east, will produce 8 tons of 25 per cent. ore per fathom. We shall communicate this level in a few days, which will ventilate this part of the mine and enable us to stope. In the west part of Manto we have met with the wall of the lode, and have suspended the same. There is a good stope of ore ground standing in the back of this level for about 5 fms. long, which will produce 6 tons of 40 per cent. ore per fathom. A stope in the back of the 135, on the south part of Manto, will produce 8 tons of 20 per cent. ore per fathom. On account of this ground being so wet and undrained it is very difficult to make the progress here that we could wish, but with the communication anticipated in the former part of this report will entirely drain and ventilate this part of the Manto. A new end in the 128, driving west 45° north, will produce 1 ton of 18 per cent. per fathom. This is yellow sulphurets, or, as it is more commonly called here, bronces. We may expect a splendid lode of ore here shortly, as it is driving in the direction of the bunch of ore standing in the back of the level below. A new end in the 122, on the south part of Manto driving west, is producing good stones of ore. The object of driving this level is to cut a bunch of ore supposed to be standing in the west part of the Manto. In the north part of the Manto, new end, the 122, driving north 45° east, will produce 1 ton of 30 per cent. ore per fathom. A tribute pitch in the back of the 122 at half tribute will produce 4 tons of 25 per cent. ore per fathom. Since my last there is a good discovery made here of yellow ores, which is likely to lead to a splendid bunch of ore. In the past fortnight we have had great inconvenience, arising from the old workings not being properly filled up, and the big timbers are crushing, so we had to put all the people to fill up and secure the old workings, which is accomplished for the meantime.—Santa Helena Mine: A chiffon sinking on the course of the Manto is producing good stones of ore.—San Antonio Mine: In the new shaft sinking from surface the ground is favourable. We have not been able to get workmen to put in this shaft as anticipated, but hope to be able to get workmen sent from Copiapo. A great many people are leaving all the mineral districts of Chili to go to the silver mines of Bolivia, a place called Caracoles.—Cuba Mine: We are sinking a chiffon or winze here from surface on the course of the Manto. This is producing small stones of ore. In conclusion, I beg to state the mines are looking very favourable, and everything is in good working order.

General Brazilian.—Report for August: St. Anna: The shallow adit has been driven 3 fms.; ground here rather troublesome. Explorations in search of vein have been carried on from No. 2 shaft (bottom of old adit) and a line of pay dirt was cut, which no doubt would well repay treating on a large scale. —Itabira: The shallow adit driven 3 fms. 1 ft.; nothing more to note on this side of the property.—Produce: 131 oits. derived from a few boxes of vein stuff taken out of bottom of old adit, "Sant' Anna," and from debris from Itabira new exploration.—Extract from letter dated Sept. 16: Mine: We are sorry to state that owing to letters received from agents we were obliged to suspend the driving of both adits until further advice. Our remaining force is employed exploring both at Santa Anna and Itabira. A canoa was fixed at the mouth of the Santa Anna adit for treatment of stuff from bottom of old adit. A few tons of dirt roughly passed through this canoa yielded 34 oits. of gold.

Anglo-Brazilian.—Report for August: Passagem: Produce, 1107 oits at 9s., 498*l*. 3s. 0d.: cost, 1016*l*. 7s. 9d: loss, 517*l*. 4s. 9d. The amount of ore treated during the month falls short by 183 tons compared to that for July, owing to the continued scarcity of water. The average produce per ton extracted shows an improvement of 0·690 oitavas, or 29·96 per cent. This, compared with the assay value of the month's samplings, gives an effective separation of the gold contents of the stone of 72 per cent., which is highly favourable for ores of this class. The arrastras, from want of water, have not worked for the month.—First division of September: Passagem: The raising of stone for the past month is very fair, and though of poor produce has yielded well. A large percentage of the cost is still confined to general repairs, particularly in the reduction department, where there is still much to be done. Expenditure will be found high for August, notwithstanding the reduction made in mine force; on the other hand there is an excess in materials, travelling expenses, and other charges. Cost for the present month will be much lower, but no further increase of produce can be expected until the wet season sets in, the supply of water failing daily.

Rossa Grande.—The cost for the month, including 42*l*. 10s. 10d. spent at Gongo, and 11*l*. 15s. 9d. in finishing Cachoeira pumping-wheel, pumps, &c., amounts to 296*l*. 9s. 1d. With the exception of a slight hindrance in sinking Richard's shaft, owing to increase of water, the works both in and out of the mines have advanced with regularity, and you will be pleased to learn that the lode in the Bahu Mine is opening out splendidly. Having put the Cachoeira pumping-wheel to work on the 13th of the month, the duty of the mechanics at present is almost entirely confined to getting about the necessary materials for carrying on our underground operations.—Gongo River: The sand accumulated from the trials of the stuff in the bed of this river has been cleaned up, which produced 19 oits. of gold. Extract from letter dated Sept. 16:—Gongo River: We are forcing on the sinking as fast as possible, but as yet nothing has been discovered worthy of notice.—Bahu: The lode in the 10 west is 3 ft. 6 in. wide, and fully maintains the value stated in my report. All other points under operation are without change to remark.

Sao Vicente.—Extract from letter dated Sept. 16: Brucutu: We have been short of hands during the past month, but not so as to interfere with the principal works. There is a most extraordinary change in the deep adit; the ground, which for some time past has been so troublesome owing to its extreme softness, has changed to very hard ground, a great portion of which we are obliged to blast. You are aware from former reports that we have crossed several small lines in this adit showing gold, consequently it is necessary for me to inform you that it is impracticable to further explore these lines until the ground in the immediate vicinity of the lines is properly drained. I am pleased to say we are making good progress in this level at present.—Sao Vicente Proper: The driving of the cross-cut at Barracao has been continued; there is a slight change in the ground, which looks as if we were nearing the footwall. On Sept. 11 we struck another line in the cross cut, which shrwtd a very fair sample of gold—in fact, the best we have ever taken from this place: this place is well worth the attention of any company, and ought to be thoroughly explored. The health of both the establishments is very good.

Taquaril (Gold).—W. H. Martin: Report for August: The works during the month have progressed steadily, but I regret to state that there is nothing intersected in the exploratory operations to call for special comment. In the junction of lodes below the 25, west of Haymen's shaft, the gold-bearing vein presented favourable indications towards the middle of the month, and yielded a little better quality work, but soon got wrung up again by hard ground. The water getting more powerful on the 24th we discontinued working at this point. Nothing has been sent to the stamps for treatment since the 26th of the month.—Mine Report: At Haymen's shaft operations during the mon h have been confined to stoping in the bottom of the 25 west at the point of junction of lodes: 15·21 cubic fathoms of ground have been stoped. The lodes at this point have repeatedly shown signs of improvement. The gold bearing vein being small, and the ground hard for excavating, with an increase of water, which we found expensive and troublesome to drain by manual labour, on the 24th of the month we ceased working at this point, the only place in the mine from which a little produce was being derived. The native cross-cut has been extended north 1 fm. 4 ft. in hard sandstone, intersecting occasionally small veins of light clay-slate.—Deep Adit: No. 1 cross-cut, going north, has been extended 1 fm. 5 ft.: the ground here is hard for exploring. We are daily expecting to intersect the No. 1 lode at this point. The above adit has been extended on No. 1 lode, east of No. 2 cross-cut, 3 fms. 1 ft. 3 in. The lode in this end is composed principally of hard sandstone, iron, and felspar. On the south side small branches of clay-slate in the manganese occasionally show particles of gold in the bates. A little exploratory work has been carried on at various points, but to date nothing met with to notice.—Timbering: 20 props have been put in and four girders to keep up the manganese in the stopes at the junction of lodes, and four sets of timber put in the deep adit.—Produce: The produce for the month amounts to 383 oits., derived from 152·50 tons of ore, thus:—From stamp 183 oits., from 152 tons=1·204 oits. per ton; Vein stuff, 200 oits., from 0·50 ton = 400 oits. per ton: Total, 383 oits., from 152·50 tons.

First Division of September.—Extract from Capt. W. H. Martin's letter, dated Sept. 16: General Remarks: Our force both of natives and blacks is very much reduced, and operations are confined to exploratory works in the deep adit, driving the natives cross-cut north, and trying on the back of the lode in various places, but to date I regret to say nothing of an encouraging character has been met with.—Capt. Pengilly: In reply to your remarks under this head I beg to state that the magnificent shoot of gold alluded to by the above-named gentleman in his report, left by the former workers near the bottom of the old engine-shaft, must have been taken away before I had anything to do with the mine. The workings by the present company at the bottom of the old engine-shaft have been extended on both the No. 1 and 2 lodes east and west, much beyond the limits of the former workers, and of course any shoots or gold-bearing veins left as stated must have been found and worked out. I have searched and sampled every foot of ground in the old workings near the bottom of the old engine-shaft, and 15 fms. above as well as below, but no such shoot as Capt. Pengilly describes can be found. The riches said to have been left by the former workers must have been greatly exaggerated.

Chontales.—The directors have advices from Mr. Belt, dated Sept. 15: Gold returned for the month of August, 233 ozs., from 1842 tons of ore; average yield, 2½ dwts. per ton; value, 607*l*.; cost for the month, 1011*l*., which includes the sum of 80*l*. for freight and erection of new machinery. Mr. Belt, in his last letter, written just prior to his departure from Greytown on his return to England, reports that the low cost at which he had calculated the returns could be made when 24 heads were fully at work, had been more than realised during the preceding month. He considers a small profit will be made during September, and that the company will be able to realise good returns in future, as the Santo Domingo had improved, and the San Sebastian Mine was opening out well; and just before his departure the 12 extra revolving stamps, with rails sufficient for the tramway to connect the latter mine with the mill, had arrived. The health of the establishment was good.

— Sept. 5: Report for August: East San Benito Mine: A stope in the back of No. 2 level has been stoped 126 varas; lode 4 ft. wide, worth 2 dwts. of gold per ton. A stope in the back of No. 1 level has been stoped 76½ varas; lode 3 ft. wide, worth 2½ dwts. of gold per ton. No. 2 level has been driven west 14¼ varas; lode 3 ft. wide, showing a little gold, but not to value. No. 2 level has been driven east on the course of the lode 2 varas; the lode is 2 ft. wide, but poor, and very difficult for driving.—Santo Domingo Mine: The intermediate level has been driven east on the course of the lode 12 varas, which is 6 ft. wide, worth 2½ dwts. of gold per ton.. A stope in back of the same level has been stoped 114 varas; lode 6 ft. wide, worth 2½ dwts. of gold per ton. No. 2 stope from the surface, on the south part of the lode, has been stoped 10 varas; lode 4 ft. wide, worth 7 dwts. of gold per ton. The quantity of quartz sent to the stamps for the month is as follows:—From Santo Domingo, 943 tons, yielding 2¾ dwts. of gold per ton; from East San Benito, 899 tons, yielding 2¼ dwts. of gold per ton; in all, 1842 tons, which have been mined and stamped at a cost of $4656·28, or at $2·53 per ton of quartz: this cost includes managing expenses and all other charges for the month, with the exception of $400 paid for freight of new machinery. The total amount of melted gold is 233·7 ozs.—J. Tonkin, D. Tonkin.

Emma.—Telegram: "Forwarded no ore this week to New York. Raised 480 tons first-class ore this week. Raised no second-class ore this week: 500 tons first-class ore this week at railway depôt: 80 tons first-class ore raised at mine: 330 tons sold here."

Javali.—The directors are in receipt of advices from their manager, under date Sept. 5: 1479 tons of quartz had been crushed, yielding 369¼ ozs. of gold, valued at $4750. The expenditure was $2684·50, including $400 for freight, and the profit for the month 2060·41. The health of the establishment was good, and labour sufficient.

Sierra Buttes.—The result of the Eureka clean-up for the month of September from the Old Lower Mill is as follows:—Receipts $21,125: 936 tons of ore were crushed during the month; cost of mining and milling same $9959·04. [This clean-up was from the Coulter and Reis Mills only, the Hanks Mill having been pulled down previous to re-building.]

I. X L.—Lewis Chalmers, Sept. 23: We are getting on famously. When we recommenced operations (19th inst.) the lower tunnel was in 944 ft. During the week ending 14th inst. the men were occupied two days putting in air-pipes, and four days driving; 6 ft. were run. At the 946 there was good ore in the top of the tunnel, and the whole face was ledge matter; the quartz very hard. During the week ending Saturday only 8 ft. were made, making the whole length of tunnel 958 ft. There are very good stones of ore in the face, and it improves daily. The hoisting machinery has not arrived.—Extract from *Alpine Chronicle*, Sept. 21: This week they have taken out ore from the face of the tunnel that is valued at 33000 per ton.

Exchequer (Gold and Silver).—Exchequer Mill, Silver Mountain, Sept. 17: I have now to report that I have discontinued driving the upper tunnel, and have commenced running on the level of the I. X. L. lower tunnel towards your Accacia ledge, from which I took some very fine specimens of ruby silver on Saturday last. You are aware it was my intention to erect the hoisting works over the old winze, and for that reason to "raise" the winze to the surface. I have resolved not to do so for several reasons, which did not occur to me till again on the ground; but chiefly because—following the altering dip of the ledge the winze is too *crooked* for a *fast* running hoister to work on it safely or to advantage. On referring to former reports you will find that from the commencement this was intended only for a prospecting shaft, and as such it has *served its purpose*. I should also have had about 100 ft. of shaft to raise in hard rock to get to the surface to reach the place where the hoisting works would have to be erected if over the winze, and then the access to them would be both difficult and inconvenient, and the necessary buildings, from that cause, costly. Almost as low as the *bottom* of the present winze about 390 ft. further south down the mountain a shaft could be sunk 140 ft., which would bring you to the level of the Accacia, which you will see by my estimates I formerly proposed to reach by sinking the winze 127 ft. further; but before being in a position to do this I had, as explained, to get to the surface by "raising" 100 ft.—in all, 227 ft. Our best ore has always run south, and at the present moment lies *south* of the winze; hence my anxiety to get down even 127 ft. further, where I *know the ore to be good*.

From this shaft, when down to the Accacia level, 340 ft. driving on the ledge will bring you right under where I was getting the rich ore in the south drive from the winze when I stopped: and I am *positive* that I will get rich ore in the shaft *the moment I strike the ledge*, from the way the ore has always "pitched" in the stopes and drivings above. I shall accordingly erect my hoisting works *there*, and will be at the Accacia level, and driving back to the Buckeye "No. 2" ground, in 12 weeks from the start, and in 13 weeks shall be stoping out ore equal in quality and surpassing in quantity anything we have yet had, thereby saving at the same time 240 ft. of hoisting every car-load of ore taken to the surface. But for this I should have been much vexed by the non-arrival of the hoisting works, which have been delayed by the strike among the New York mechanics. Friday's mail, however, brought me the welcome intelligence that they were dispatched on Aug. 28, and I am now daily expecting their arrival. With regard to the amount of ore and the bullion I am to send you within a definite period, I wish you to understand that I will not commit myself, but I believe I will do all I anticipated when I have the pleasure of meeting the shareholders in London. I am doing the best a man can for the interests of all concerned.

Regarding the mill, the result of some recent experiments and inventions here and in Nevada has been to successfully establish what is known as the wet process of reduction, which is now *exclusively* practised in Virginia City and Gold Hill, on similar ore from the Comstock lode, where no such thing as roasting is now considered necessary. Accordingly, I made arrangements with the Tarshish Mill Company, and had 2 tons of our ore worked there, and watched the working. The result was 68 per cent. of the fire assay. Taking, therefore, the wet process, and an average grade of ore—say, $40 per ton by assay,—and giving it credit for only 60 per cent. of the fire assay instead of 68, the calculation will be as follows:—

12 tons a day at $40 per ton	$480
60 per cent. of $480 is	$288
The cost of working wet does not exceed $6, but call it $8 per ton: 12 tons at $8	96
Total	$192
Now, in wet crushing all the sulphurets that have not been grasped by the mercury are saved, and when concentrated will pay to roast in our own reverberatories, for which add 20 per cent. = $96, and allow half for cost of roasting, which leaves	48
Making a net profit per day of	$240

The *simplicity* of the system is its great recommendation. *Wet* crushing, therefore, *without roasting*, I resolved to adopt, because I can obtain better results without roasting than with, at a smaller cost, *and can reduce thereby* 16 *tons a day in the place of* 12 *tons*. Anxious to push the work through before winter sets in, I have at work in the mill and saw-mill six carpenters, two blacksmiths, one sawyer, one engineer, five labourers, and one teamster. I employed Mr. S. Fountain, now the first mill builder in the State, and on his plans I am acting. I need only add that when completed you will have an A 1 mill, that it can be extended indefinitely, that I am saving every cent I can consistent with a due regard to the efficiency of the mill, and its substantial construction; and that it will work either *high* grade or *low* grade ore to more profit than a Stetefeldt furnace.

Pacific.—H. Prideaux, Sept. 27: I last wrote you on the 13th inst., since which I have received your letters, dated Aug. 27 and Sept. 3, also telegrams of the 16th and 20th inst. My answer to your message of the 16th was we could not ship 10 tons of first-class ore immediately, but could good second-class, and we expected to forward 4 bars bullion against the meeting. Immediately after sending this dispatch a break occurred in the vein in Nos. 1, 2, 3, 4, and 6 stopes, on Batters's ledge, and the ore fell off in value; these were very important points, but they are at present producing scarce any ore—in fact, there are only four men working in these five stopes. But in No. 5 stope we have some good ore, there being an indication of a break near. We have now commenced three new stopes below the 400 ft. level, Batters's ledge, known as Nos. 7, 8, and 9 stopes. I shall not be able to ship you any bullion until these stopes are properly opened out; this, I expect, will not be done in time for the meeting. On the Buel North Star we have a good vein, from which we expect to extract a quantity of ore. I am pushing work here, in order to commence two new stopes on this ore. I delayed writing for a few days, to ascertain if the vein continued through the break; this I found to be so, and we shall soon commence to cross-cut for the same. I think we shall cut the vein again, but sometimes these breaks are very troublesome.

Braganza.—Morro Tabac, Sept. 16: We have found a sink 30 ft. deep, in the bottom of which are deposits of metaliferous stone, composed of quartz, iron, mica, and arseniecal pyrites, from which we took some promising samples of gold. This was evidently made by the ancients on a soft vein of friable quartz, but having no machinery they could not treat the stone. We are now driving a short level about 8 fms. to cut this below the sink, and are now working on the course of a friable quartz vein from 6 to 8 in., which has produced some very good samples of gold. Having at this point a command of water, we intend passing the stuff through a sluice box; in this we shall, no doubt, catch all the gold disintegrated from the softer portions of the vein. The hard stone we purpose conveying for the present on the back of mules to the stamps to test thereby the value of the stone.

Battle Mountain.—Capt. Richards, Sept. 19: Virgin: In Pascoe's winze, sinking below the 188, we have at present a vein of ore 4 in. wide. Although considerably mixed with clay the ore is of a superior quality, and if the mine is sunk to a much greater depth we are, I think (from present indications), working above a tremedous body of ore, but the ground being so terribly broken up at and for some distance below the surface in this section of the country, we are not surprised to lose sight of all ore and even the lode itself any day, but if the proper machinery is furnished, and the mine worked much deeper, I fully believe in the development of a splendid property. The 113 ft. level being driven north is of a promising character, yielding a little ore, but this point has not improved since last week's report. Pierce's stope, in back of the 113 ft. level, is turning out some very fine ore, and is at present our chief source of supply. Jack's stopes, in the back of the 73 feet level, have greatly fallen off in their yield of late. The 73 feet level being driven north is poor, with green stains through the clay, which always accompany the hanging or western wall of the lode.—Lake Superior: Richards's winze, sinking below the 13 ft. drift south, has somewhat improved in appearance, the ground being easier to work, and showing a little ore, although not enough to save. Number of sacks raised this week, 420.

Bensberg.—Mr. Hoffmann, Oct. 12: The wash ore improved very much last week; with the same labour, and from the same quantity of stuff as before, we obtain 50 per cent. more ore dressed. There is a great quantity of rock ore amongst it, which can only be dressed by machinery, and it will have to be well crushed to get out the ore. We cleared a very good bed of rich carbonate at the west end, and shall commence getting the ore next week. The shaft was at a standstill the whole week, there being so much water that we could not work in it; we shall continue draining it a little longer before going deeper. The brickwork of the dressing-house is mostly furnished, and we are busy at work with the roofing.

[For remainder of Foreign Mines see to-day's Journal.]

THE COPPER TRADE.

The advices by telegram received at the close of September that the Chili charters for the second fortnight in August were only 1040 tons, making for the month 2240 tons, and the intelligence by mail to August 17, that the available quantity of copper on the West Coast was but 3757 tons, were just beginning to counteract the effect of the English smelters' reduction of 10*l*. per ton, when the trade was startled by the announcement of a sale by tender of nearly 1000 tons of English copper in raw and manufactured state. This notification has, for the moment, completely paralysed the market, English copper is rendered unsaleable, while Chili bars have given way 4*l*. and fine Australian about the same. It is most unfortunate that by the terms of this tender the trade will be left in the dark as to whether the copper has been disposed of or not. The actual clearance of such a quantity, supposing it to go into consumption or be exported, would go far to help present prices, but further depression must ensue so long as it is believed that so large a quantity of copper may be thrown upon the market at any moment.

The figures we append indicate an ever increasing stock, and a further falling off in exports, showing that the remarks we made in June last, which were so severely criticised at the time, were based on facts. The world has certainly allowed us to stock ourselves with copper from all parts, but we do not seem to be permitted to sell at our own price. We have now returned to prices that were ruling when outside speculation first set in. The advance between October, 1871, and January of this year, was looked upon generally as being that naturally consequent upon a period of long depression, heightened by the Franco-German war, and considered perfectly legitimate; on the other hand, the unhealthy speculation that followed has produced nothing but loss to the operators themselves, and has done a considerable amount of harm to the copper and mixed metal trade generally. The very large present stock must now keep prices from advancing. Should the production of Chili, as seems to be anticipated, now begin to fall off somewhat, stocks will have a chance of being reduced in some degree, especially as our exports all the year have been so small: from all aspects of the market, however, much higher prices cannot yet be hoped for.

The following statistics show the position of copper since October last to the present date:—

	Price.				Stock on hand.		Stock, including afloat and chartered.	
1871—Oct. 1	£68	0	0	Tons	24,964	Tons	35,564	
Nov. 1	67	0	0		24,051		37,401	
Dec. 1	75	0	0		19,307		29,957	
1872—Jan. 1	85	0	0		18,054		30,054	
Feb. 1	85	0	0		19,563		29,503	
March 1	88	0	0		20,047		29,647	
April 1	97	0	0		19,507		30,907	
May 1	101	0	0		21,435		34,295	
June 1	107	0	0		21,595		35,495	
July 1	104	0	0		23,213		37,447	
Aug. 1	103	0	0		27,733		39,733	
Sept. 1	90	0	0		27,922		39,989	
Oct. 1	84	0	0		29,342		41,409	

Increase in price since Oct., 1871, 16*l*.; decrease in price since Jan., 1872, 1*l*.; increase in actual stock since Oct. 1, 1871, 4378 tons; increase in actual stock since Jan. 1, 1872, 11,288 tons; increase in stocks since Oct. 1, 1871, including afloat and chartered, 5845 tons; increase in stocks since Jan. 1, 1872, including afloat and chartered, 11,355 tons.

The exports of copper taken from the Board of Trade Returns for the first nine months of the following years are as follows:—1868, 38,224 tons; 1869, 34,490 tons; 1870, 39,543 tons; 1871, 39,604 tons; 1872, 31,866 tons.

Decrease in exports over the first nine months of 1868					Tons 6358
Ditto	ditto	ditto	1869		2624
Ditto	ditto	ditto	1870		7677
Ditto	ditto	ditto	1871		7733

The comparative positions of the month of october in the past four years, with the present, are as follows:—

	Price.				Stock.		Stock, including afloat and chartered.	
1868—Oct. 1	£68	0	0	Tons	21,227	Tons	34,292	
1869—Oct. 1	68	0	0		30,100		46,636	
1870—Oct. 1	63	0	0		32,181		45,419	
1871—Oct. 4	87	0	0		24,964		35,539	
1872—Oct. 1	84	0	0		29,342		41,409	
Present excess in price over 1871							£17	0 0
Ditto ditto 1870							21	0 0
Ditto ditto 1869							16	0 0
Ditto ditto 1868							16	0 0
Excess in stock over 1871						Tons	4378	
Decrease in stock over 1870							2839	
Ditto ditto 1869							758	
Excess in stock over 1868							8115	
Increase in stock, including afloat and chartered, over 1871							5870	
Decrease in stock, including afloat and chartered, over 1870							4010	
Ditto ditto 1869							5227	
Increase in stock, including afloat and chartered, over 1868							7117	

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Cutting Coal.—Mr. W. Benson, of Allerwash, Northumberland, has invented some improvements in machinery or apparatus for cutting coal, which relate to a peculiar combination and arrangement of machinery or apparatus for cutting, holeing, or winning coal, and in the mode of driving or actuating the same, and consists in the use of a horizontal wheel of about 4 ft. or 5 ft. diameter, composed of steel or wrought-iron arms or spokes cast into a boss, the said arms being caused to enter the rim of the wheel, which may be of wrought-iron, at or near the upper and lower edge, alternately crossing each other, and being set in the boss at alternate sides, thereby imparting great stiffness to the wheel; additional stiffness is obtained by introducing a metal V-shaped ring above and below the arms alternately. These arms are secured by nuts, or are rivetted into the said rim. The gearing is set in motion by means of a wire, manilla, or other rope, which by preference extends between the drums of two separate and distinct winding-engines, situate one at each end of the working, the said rope being caused to pass partially or nearly round a V-grooved or gripping pulley, mounted on the driving shaft of the machine. In some cases a single engine with two drums may be used, the rope being guided, as in the round-about system of steam ploughing, round any required number of guide pulleys.

Steam-Boilers.—Mr. J. Smith, of Crosby Hall-chambers, Bishopsgate, has patented some improvements in steam-boilers and their appendages. The novelty of the first part of his invention, which relates to that description of boilers in which double pendant tubes are used, consists in the bulb formation of the outer tubes above the crown plate and the perforations therein, and of the second part of the invention in the employment in connection with the outer shell of the boiler, and where subjected to the full pressure of the steam of a disc held in position by a band or ring of soft metal, or combination of metals, and constructed so as to blow out at a fixed pressure to allow the steam to escape immediately it reaches a pressure dangerous to the boiler, and in the employment of a whistle when desired, so and in such a manner that the said steam whilst escaping shall sound an alarum.

Malleable Cast-Iron.—Mr. A. F. Andrews, of New Haven, U.S., in his improved process of making malleable cast-iron, subjects the castings to the influence of hydrogen or its compounds, either alone or associated, or alternated with carbonic oxide or acid at a certain temperature. In one modification of the invention, the hydrogen or carbonic acid is associated also with lime, oxide of iron, or other metallic bases, either separately or mixed, and in another with clay, silica, or the silicates. The castings are produced in the ordinary manner from the ordinary varieties of iron suitable for being subsequently made malleable. The treatment requires a hot furnace, with means for varying the temperature, so that it may be raised towards the latter portion of the treatment of each batch, to which it is intended to keep continuously hot for a long period: a cooling pit or space in which the walls may be allowed to remain at a moderate temperature; provisions for manufacturing or supplying hydrogen gas: a store of lime, and the other materials, and a quantity of cases peculiarly adapted to each other and to the furnace to form a series entending along within the furnace through which the hydrogen gas may be passed to expose the castings.

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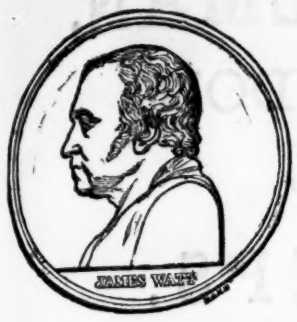

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PRIZE MEDALS:

Royal Cornwall Polytechnic Society, August 21, 1872.

Liverpool and Manchester Agricultural Show, Sept. 12, 1872.

Middleton Agricultural Show, Sept. 18, 1872.

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Net price, 15s. per cwt., carriage paid; 5 per cent. off 1 ton orders; free from acids.

A TRIAL SOLICITED.

SPECIALLY RECOMMENDED for LOCOMOTIVES, being completely soluble in water, and only requires to be put into the tender.

McNIEL, MULLER, AND CO.,

39, MARKET STREET,
MANCHESTER,

SOLE AGENTS FOR { "S. B. HÆMATITE," "S. B. YORKSHIRE," "CLAY LANE," "CLAY CROSS," } PIG IRON

AGENTS FOR JACKSON, GILL, AND CO., IMPERIAL IRONWORKS, NEAR MIDDLESBOROUGH;
DARLINGTON WAGON COMPANY, DARLINGTON.

SCOTCH, HÆMATITE, STAFFORDSHIRE, DERBYSHIRE, FOREST OF DEAN, COLD BLAST AND REFINED PIG IRON, PUDDLED BARS AND BAR IRON, STEEL, SPELTER, TIN, COPPER, LEAD, SHEETS, ORES, BOLTS, NUTS, SPIKES, MANUFACTURED IRON, &c., &c.

CAPTAIN TREGAY'S
IMPROVED PATENT
STAMP **COFFER,**

FOR STAMPING GOLD QUARTZ, TIN, AND OTHER ORES.

The grateway is extended, discharge doubly increased, and power economised. May be inspected in full work, on application to Captain TREGAY, Redruth, Cornwall, who is PREPARED to TREAT for GRANTING LICENSES for its use, and to SUPPLY the MACHINES.

AWARDED TWENTY GOLD AND SILVER FIRST-CLASS PRIZE MEDALS.

IMMENSE SAVING OF LABOUR
TO MINERS, IRONMASTERS, MANUFACTURING CHEMISTS, RAILWAY COMPANIES, EMERY AND FLINT GRINDERS, McADAM ROAD MAKERS, &c., &c.

BLAKE'S PATENT STONE BREAKER,
OR ORE-CRUSHING MACHINE,

FOR REDUCING TO SMALL FRAGMENTS ROCKS, ORES, AND MINERALS OF EVERY KIND.

This is the only machine that has proved a success. This machine was shown in full operation at the Royal Agricultural Society's Show at Manchester, and at the Highland Agricultural Society's Show at Edinburgh, where it broke 1½ ton of the hardest trap or whinstone in eight minutes, and was AWARDED TWO FIRST-CLASS SILVER MEDALS. It has also just received a SPECIAL GOLD MEDAL at Santiago, Chili.

It is rapidly making its way to all parts of the globe, being now in profitable use in California, Washoe, Lake Superior, Australia, Cuba, Chili, Brazil, and throughout the United States and England. Read extracts of testimonials:—

The Parys Mines Company, Parys Mines, near Bangor, June 6.—We have had one of your stone breakers in use during the last 12 months, and Capt. Morcom reports most favourably as to its capabilities of crushing the materials to the required size, and its great economy in doing away with manual labour.
For the Parys Mining Company,
H. R. Marsden, Esq. JAMES WILLIAMS.

The Van Mining Company (Limited), Van Mines, Llanidloes, Feb. 6, 1871.—Our machine, a 10 by 7, is now breaking 180 tons of stone for the crusher every 24 hours. I may say, of all our machinery, that for simplicity of construction and dispatch in their work, they are equal to anything in the kingdom, but your stone breaker surpasses them all. W. WILLIAMS.
H. R. Marsden, Esq., Leeds.

Chacewater, Cornwall, Jan. 27, 1869.—I have great pleasure in stating that the patent stone breaker I bought of you some three years ago for mines in Chili, continues to do its work well, and gives great satisfaction. It crushes the hardest copper ore stone—put it through ¼ inch size by horse power—with great ease. I can safely recommend it to all in want of a crusher; can be driven by steam, water, or horse power.
H. R. Marsden, Esq. JAMES PHILLIPS.

Terras Tin Mining Co. (Limited), near Grampound Road, Cornwall, Jan. 1871.—Blake's patent stone crusher, supplied by you to this company, is a fascination—the wonder and admiration of the neighbourhood. Its simplicity is also surprising. Persons visiting it when not at work have been heard to remark, "This can't be all of the machine." It will crush to a small size from 8 to 10 tons of very hard and tough elvan rock per hour; taking into its leviathan jaws pieces of the hardest rock, weighing 200 lbs. or more, masticating the same into small bits with as much apparent ease and pleasure as does a horse his mouthful of oats. On every 100 tons of the rock crushed by the machine there is a direct saving to the company of not less than £5 over the process of hand labour previously adopted by them, and the indirect saving much more, the machine being ever ready to perform the duties required of it. It breaks the stuff much smaller, and in form so fitted for the stamps, that they will pulverise one-third more in a given time than when performed by hand labour.
JOS. GILBERT MARTIEN.
H. R. Marsden, Esq., Leeds.

Welsh Gold Mining Company, Dolgelly.—The stone breaker does its work admirably, crushing the hardest stones and quarts. WM. DANIEL.

Ovoca, Ireland.—My crusher does its work most satisfactorily. It will break 10 tons of the hardest copper ore stone per hour.
WM. G. ROBERTS.

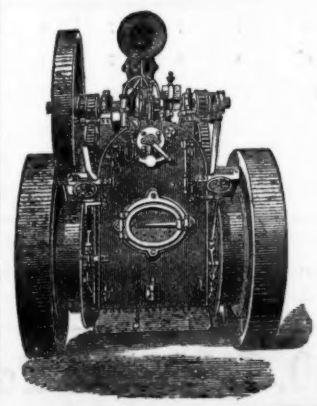
General Frémont's Mines, California.—The 15 by 7 in. machine effects a saving of the labour of about 30 men, or $75 per day. The high estimation in which we hold your invention is shown by the fact that Mr. Park has just ordered a third machine for this estate. SILAS WILLIAMS.

Your stone breaker gives us great satisfaction. We have broken 101 tons of Spanish pyrites with it in seven hours. EDWARD AARON.
H. R. Marsden, Esq. Weston, near Runcorn.

For illustrated catalogue, circulars, and testimonials, apply to—

H. R. MARSDEN, SOHO FOUNDRY,
MEADOW LANE, LEEDS,
ONLY MAKER IN THE UNITED KINGDOM.

ROBEY AND COMPANY, LIMITED,
ENGINEERS, LINCOLN.



PATENT PORTABLE
HAULING AND WINDING ENGINE
WITH
PATENT DRUM WINDLASSES,
FOR MINING PURPOSES.

This Engine is specially commended to Mining Engineers and others, as by its adoption—
Haulage along inclined drifts is easily and cheaply effected;
The expense of sinking new shafts is greatly reduced, neither foundations nor engine-house being required;
It is available not only for winding, but for pumping, sawing, &c.—a great desideratum at a large colliery;
It can be very quickly removed (being self-propelling), and fixed in any desired position.

Prices and full particulars on application as above, and also references to view the engine in successful work near Derby, Carnarvon, Haverfordwest, Darlington, Durham, Penzance, and other places.

THESE ENGINES WORK WITH MARVELLOUS ECONOMY IN FUEL.

TANGYE BROTHERS AND HOLMAN,

10, LAURENCE POUNTNEY LANE, LONDON,

CORNWALL WORKS (TANGYE BROTHERS), BIRMINGHAM,

SOLE MAKERS OF

THE "SPECIAL" STEAM PUMPS.

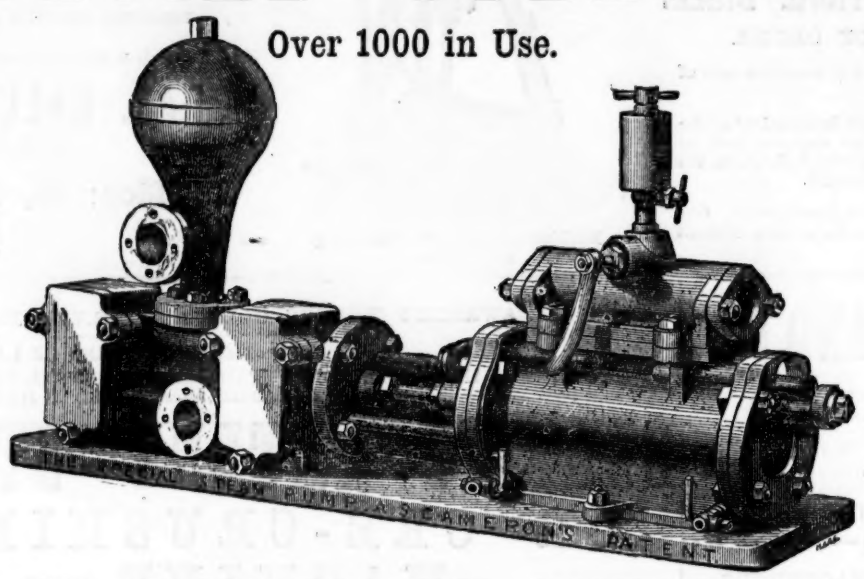
IN USE AT THE FOLLOWING QUARRIES:—

Carnarvon and Bangor Slate Co. ...	5	Pumps.
Kellow, J. E., North Wales Slate Co...	1	"
New Zealand Quartz Crushing and Gold Mining Company...	1	"
Scott, R. W., Dungannon, Ireland ...	1	"
Foster, J. S., Hebburn Quarries ...	1	"

IN USE AT THE FOLLOWING CHEMICAL WORKS:—

Alum and Ammonia Co., Bow Common	2	Pumps.
Barnes, W. C., Hackney Wick... ...	2	"
Burt, Boulton, and Hayward, Tar Works, Millwall	1	"
Cory and Co., Manor-street, Old Kent-road	2	"
Whiffen, Thomas, Battersea	1	"
Jones, W., and Co., Middlesborough...	4	"
Jarrow Chemical Co., South Shields..	1	"
Richardson, J. G. and N. H., Jarrow-on-Tyne	1	"
Read, Holliday, & Sons, Huddersfield	1	"
Sheldon, Nixon, and Co., West Jarrow	2	"
Tennant, C., and Co., near Newcastle.	7	"
Webb, H., & Co. (Manure), Worcester	1	"
Union Chemical Company, Stratford..	1	"

Over 1000 in Use.



NOTE,

Requires NO Shafting, Gearing, Riggers, or Belts.

All Double-Acting:

Works at any Speed, and any Pressure of Steam.

Will Force to any Height.

Delivers a constant stream.

Can be placed any distance away from a Boiler.

Occupies little space.

Simple, Durable, Economical.

IN USE AT THE FOLLOWING COLLIERIES:—

Adelaide Colliery, Bishop Auckland	3	Pumps.
Acomb Colliery, Hexham	1	"
Blackfell Colliery, Gateshead	1	"
Black Boy Colliery, Gateshead	1	"
Castle Eden Colliery	2	"
Crofton, J. Ct., near Ferryhill	1	"
Carr, W. C., Newcastle	4	"
Etherley Colliery	1	"
Gidlow, T., Wigan	3	"
Haswell, Shotton, and Easington Coal Co. ...	2	"
Lochgelly Iron and Coal Company	1	"
Leather, J. T., near Leeds	2	"
Lumley Colliery, Fence Houses	1	"
Monkwearmouth Colliery, Sunderland... ...	1	"
North Bitchburn Colliery, Darlington	2	Pumps.
Newton Cap Colliery, Darlington...	1	"
Normanby Mines	1	"
Oakenshaw Colliery	1	"
Pease's West Colliery	2	"
Pease, J. and J. W., near Crook	5	"
Pease, J. and J., Brandon Colliery	1	"
Pegswood Colliery, near Morpeth	2	"
Pelton Fell Colliery	1	"
Railey Fell Colliery, Darlington	1	"
Right Hon. Earl Durham, Fence Houses ...	1	"
Skelton Mines	1	"
South Benwell Colliery	4	"
St. Helens (Tindale) Colliery	1	"
Stott, James, and Co., Burslem	1	Pumps
Seaton Delaval Coal Company, near Newcastle	1	"
Thornley Colliery, Ferryhill	1	"
Thompson, John, Gateshead	2	"
Trimdon Grange Colliery	1	"
Tudhoe Colliery	4	"
Vobster and Mells Colliery	2	"
Widdrington Colliery, Morpeth	2	"
Whitworth and Spennymoor Colliery	3	"
Westerton Colliery, Bishop Auckland	1	"
Wardley Colliery, Gateshead	1	"
Westminster Brymbo Coal Company	2	"
Weardale Coal and Iron Company	5	"

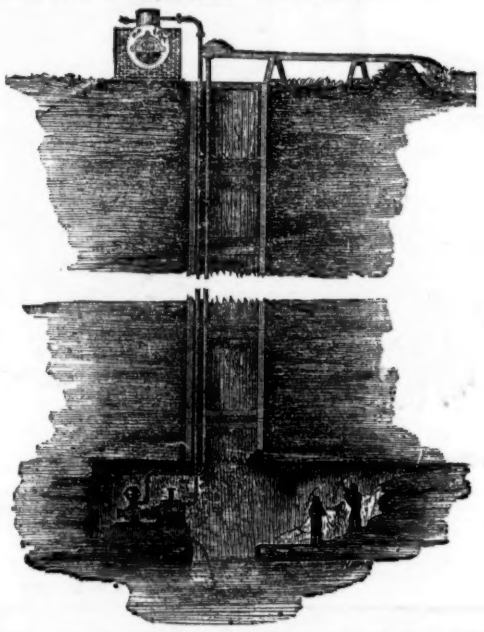
IRONWORKS AND ROLLING MILLS:—

Bede Metal Company, Jarrow	11	Pumps.
Bagnall, C. and T., Grosmont Ironworks ...	2	"
Consett Ironworks	2	"
Castleford Foundry Company, Normanton ...	1	"
Ellen Rolling Mills, Maryport	1	"
Gilkes, Wilson, Pease, and Co, Middlesboro'..	2	Pumps.
Lloyd and Co., Middlesborough	1	"
Solway Hematite Iron Company, Maryport ...	1	"
Vaughan, Thomas, Middlesborough	2	"
The Shotts Iron Company, Edinburgh	1	"
Whitwell and Co., Stockton	3	Pumps
Whessoe Ironworks, Darlington	1	"
West Cumberland Hematite Iron Company ...	1	"
Westbury Iron Company	1	"

THE "SPECIAL" STEAM PUMP AS APPLIED FOR DRAINING MINES.

The arrangement in the accompanying illustration shows an economical method of draining mines without the expense of erecting surface-engines, fixing pump-rods, or other gearing. A boiler adjacent to the pit's mouth is all that is necessary on the surface; from thence steam may readily be taken down, by means of a felted steam-pipe, to connect the pump with the boiler. The pump may be placed in any situation that may be convenient for working it, and connecting the steam, suction, and delivery pipes.

These engines can be fixed and set to work in a comparatively short time, and also at a very small outlay. They are used in large mines as auxiliary engines, and will be found invaluable adjuncts in all mining operations.



To estimate the quantity of water to be raised by any given size of pump refer to the tabulated list below. It is recommended to use long-stroke pumps where the height exceeds 100 ft., so that the largest result may be obtained with a minimum wear and tear of the pump pistons and valves. The pumps are provided with doors for ready access to all working parts.

PRICES OF THE "SPECIAL" STEAM PUMPS.

Diameter of Steam Cylinder ..... inches	2½	3	4	4	6	6	6	7	7	7	8	8	8	8	10	10	12	12	14	16	26
Diameter of Water Cylinder ..... inches	1½	1½	2	4	3	4	6	5	6	7	4	6	7	8	6	7	8	10	8	7	6½
Length of Stroke ..... inches	6	9	9	12	12	12	12	12	12	12	12	12	12	18	12	12	18	24	48	24	72
Strokes per minute	100	100	70	50	50	50	50	50	50	50	50	50	50	35	50	50	35	—	—	—	—
Gallons per hour	310	680	815	3250	1830	3250	7330	5070	7330	9750	3250	7330	9750	13,000	7330	9750	13,000	—	—	—	—
PRICE	£10	£15	£20	£35	£30	£40	£47 10	£50	£52 10	£57 10	£50	£55	£65	£85	£70	£80	£100	—	—	—	—

IF BRASS LINED, OR SOLID BRASS OR GUN-METAL WATER CYLINDERS, WITH COPPER AIR VESSELS, EXTRA, ACCORDING TO SIZE.

Any Combination can be made between the Steam and Water Cylinders, provided the Lengths of Stroke are the same, thus—8 in. Steam and 3 in. Water, or 10 in. Steam and 3 in. Water, adapted to height of lift and pressure of steam, and so on.

TANGYE BROTHERS & HOLMAN, 10, Laurence Pountney-lane, London, E.C.

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